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BEST OF VOLUMES

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PREFACE

The spread of microcomputer technology into agriculture has been rapid yet tentative. The propensity of vendors to jump into the market has been rapid, yet the propensity of farmers to buy the technology has lagged far behind. One of the reasons for this lag is a wide, almost insurmountable knowledge gap between the buyers and sellers of the technology. We started the monthly newsletter, Compu-Farm, in February of 1980 to help narrow this gap.


The newsletter was started with some apprehension. Would the newsletter be accepted? Are we working with too small a group of farmers and being too elite? The success of Compu-Farm in terms of acceptance and subscription numbers has dispelled those fears. Best of Volumes 1 to 3 was first published in March, 1984, and this year we have added the Best of Volume 4. In the following pages, we hope to present the reasons for Compu-Farm's success, good basic information and candid comment.

I gratefully acknowledge the contribution of Gary Fisher, former Supervisor of the Management Technology Unit, Farm Business Management Branch, who was Compu-Farm's editor for its first five years.

Like any good piece of material, Compu-Farm is the result of a team effort focused on one goal - to produce the best public domain newsletter on Ag-computing. I would like to recognize the efforts of some of those people on the team. To Wilson Loree, Branch Head, and Keith Brown, Supervisor of Farm Planning Section, for making the whole exercise possible. To Beth Lausen, Lori Riabko and Peggy Good for their invaluable typing skills. To Maggie Lamb and Arlene Douglas for eagle-eyed editing. And finally to all the other office staff for the mundane tasks of addressing and stuffing envelopes.

Paul Gervais, Editor
Compu-Farm Monthly Newsletter
Farm Business Management Branch
Olds, Alberta

February, 1985



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BEST OF VOLUME 1

JARGON CORNER (Issue No. 1 - February)

BIT: A single binary digit, can be either off (no voltage) or on (voltage present). They take the values 0 and 1 and can be arranged into groups called "bytes".

BYTE: A group of 8 bits that are treated as a unit. 1 byte can contain one character such as a "!" or a "A" or even a space " ". It can also represent an integer number from -127 to +127. Larger numbers need more bytes. Approximately 1000 bytes is referred to as 1k, thus 32k is about 32,000 bytes (32768 exactly).

COMPUTER BUSES: A buss is the set of electrical lines that form the internal communication lines of the computer. Along these lines are transmitted data and directions to memory and peripherals. In microcomputers, the more standard the buss, the easier it is to add memory and other peripherals. Many of the low end personal computers such as APPLE, PET and TRS-80 have their own buss structure. This means that memory or disk drives that plug into one brand will not work on another. One becomes locked into one brand and switching brands can be expensive. However, there is one microcomputer buss which has become a standard of the Institute of Electrical and Electronics Engineers (IEEE). It is called the S-100 buss. Machines which use this buss structure have interchangeable cards which can contain memory, disk or printer controllers. There are more independent manufacturers producing for S-100 than any other buss. In fact, rumor has it that the latest generation of IBM microcomputers will use this buss as well. The need to remain flexible when buying hardware is a must. If the manufacturer goes belly-up or simply stops making computers, a standard buss will keep your system running longer. (If a manufacturer gets enough market power (Apple and IBM) their buss becomes a de-facto standard).

COMPUTER LANGUAGE: The computer normally works in a special language called machine language. It is programmed into the computer one byte at a time and is extremely difficult for the non-expert to use. Fortunately, the people who are experts have written programs in machine language which translates from easily comprehended instructions (see Learn To Program In BASIC section) to something the computer can understand. These programs are called high level languages. There are two kinds of high level languages: compilers and interpreters. The computer takes the program written in high level language (called the source program) and translates it all at one time into machine language (called the object program). One then runs only the object program since the compiler is not needed. Languages like FORTRAN AND COBOL are normally compilers.

The interpreter translates and runs the source program line by line. Thus both the interpreter and the source program must be in memory at the same time; no object program is produced. BASIC and APL are interpreters.

The compiler produces a fast and memory-efficient object program, but the compiler makes it hard to work the bugs out of a given source program. The interpreter makes programs easy to debug and can be put onto ROM for instant use when the machine is turned on.

DISKS: For smaller computers the most common form of data storage is the floppy disk. It is like a thin 45 RPM record enclosed in a flat, square hardboard liner. The most common sizes are 5 1/4 inch and 8 inch diameter. They can hold from 50k to 1000k bytes of data. They are improvements on cassettes in the area of speed and reliability. For really big data storage jobs, there is the hard disk. This is a disk that is sealed within a box. The storage capacities of this disk ranged from 10 mega bytes to 40 mega bytes (a mega byte (M) is 1000k bytes).

Although the initial cost is high, the cost per byte of storage is lower than floppy disks. However, this unit has one disadvantage. When you fill up the disk you have to dump the excess onto many floppy disks or buy another hard disk or erase the data you do not need. In all cases, tapes and disks can be erased and new data can be placed on them.

How Disks Work

A disk system is composed of a controller and the actual disk drive. One controller can usually handle up to four disk drives, but usually cannot function without a program in the computer called the DOS (Disk Operating System). This program occupies up to 10k of memory which is the reason you need more memory to run disks. DOS allows you to store and retrieve programs or data, get lists (directories) of programs on the disk, destroy old programs and data and many other functions.

There are three kinds of disk drives available for micros, they are the 5 1/4", 8" and hard disks. The 5 1/4" size (5 1/4" describes the diameter of the disk used) is the most common. It can store from 80k to 300k bytes on a diskette. How do they do this? Let's look inside one and see. When you push the diskette into the drive and close the door, several things happen. A device looking like a mushroom head engages the large hole in the center of the diskette. This grips the diskette and starts turning at about 300 RPM. The read-write head starts moving out of the mechanism to engage the disk surface along a slot in the diskette sleeve (the diskette is, of course, circular and is inside a square sleeve).

The system of storing data along the disk is like a phonograph record. On a TRS-80 Model I disk system, data is laid out electrically in 35 concentric circles (called tracks). Each track is then subdivided into 10 sectors (like 10 slices of a pie). Each sector can contain 256 bytes. One track (usually track 17) is set aside for the directory of

the programs on the disk. Thus the total amount of data that can be stored on a 35 track - 10 sector per track diskette is $34 \times 10 \times 256 = 37,040$ bytes. How do we get more data on a diskette? The disk drives may be able to lay down 40 or 77 tracks or have more sectors on the outer tracks than the inner ones or store more than 256 bytes on a sector. They may also have a read-write head on the other side of the disk. This doubles the recording surface and thus doubles the amount of storage. The important thing to remember is that the greater the number of tracks, the closer the data is together. This requires higher quality (and more expensive) disk drives. You may have heard the terms single and double density and double sided. These can be defined by the number of tracks and recording surfaces. Single density has 35 to 40 tracks; double density has 77 tracks, double sided records on both sides of the disk. Each format needs the diskette that is designed for that format. These different formats explain why you cannot take a disk from a TRS-80 and plug it into an APPLE or PET.

Let's look at some of the rules of handling diskettes to prolong their life and reduce the chances of grief in the long run. It is important to realize that the read/write head actually touches the disk surface. This means that any foreign substance, even a fingerprint, will scratch both the disk surface and the read/write head. The first rules is one of handling:

Grip the diskette from the edge away from the read/write slot and return the diskette to its sleeve immediately after use.

Although the diskette is called floppy, do not bend or force it harshly into the disk drive.

Since the diskette is magnetic, the second rule warns against magnetic fields:

Don't leave diskettes on anything that contains a power supply or crt. TRS-80 owners, this means no resting diskettes on the disk drives! It is best to put unused diskettes in a box or folder some distance from any electrical device.

The third rule is environment related:

Store diskettes at room temperature if possible (they have a range between 10 and 50 deg. C.) and out of direct sunlight (they can warp in a car).

Depending on the use and the fact that the read/write head touches the surface, diskettes may only last three months, so MAKE BACKUPS OFTEN! This is especially true of users in Southern Alberta who have been subjected to highly abrasive volcanic dust in the last few months. (Mount St. Helens)

My final hint is to warn about the increasing tendency to use both sides of the diskette. This can be done by cutting some new holes in the sleeve and turning the diskette over. Not that it can't be done, since most manufacturers coat both sides with oxide to the same thickness. The problem lies with the direction of spin of the disk. With double sided drives, the disk always spins in the same direction. The inside of the sleeve contains a soft fibre that traps dust particles just like a lint brush. Now how do you remove dirt from a lint brush? You brush in the opposite direction. When you turn the diskette over to use the second side, the same effect occurs. The main surface rotates in the opposite direction to the cleaning surface and the dust is dislodged, grinding it into the oxide. Result, loss of important data. In computers, as in anything else, one can be penny wise and pound foolish.

MEMORY: This is the total amount of storage available to the computer. In this area are stored programs and the numbers you need to process. Some storage is temporary and usually disappears after the power is turned off. This is called Random Access Memory (RAM). Read Only Memory (ROM) holds permanent programs like the BASIC language. This cannot be changed except at the factory.

Most microcomputers have from 8 to 64k of RAM and from 8 to 32k of ROM. The total amount of memory in a microcomputer (called the address space) cannot exceed 64k because of the way the chips are built. Thus RAM and ROM compete for space (not so much of a problem in today's 16 bit computers with 1 MG of memory space).

How Memory Works: I want to go into more detail how the computer stores and retrieves data from its memory. Memory is like a long bank of mail boxes, eight rows high and up to 64,000 columns long. In each box is either a one or zero (voltage or no voltage) bit. Looking down the column will give an 8 bit byte. Each column is identified by a number from 0 to 64,000. When the computer wants something out of memory, it calls for the memory column and looks in the 8 mailboxes. The data bits are communicated back and further along a data buss eight lines wide (one for each bit). Some memory can only be read, while other memory can be altered by the computer. However, the directions to memory to select the correct columns are communicated along an address buss. The address buss has 16 lines, each transmitting a bit. Why 16? In the binary number system, 16 zeros give the number 0 but 16 1's is the number 65535 (hence the total address space of a micro being 64k). Thus to get the byte at location 15347, the sequence 0011011011110011 is transmitted down the address buss. You can test your RAM memory and even locate a defective chip by using your new found knowledge and a map of where your RAM memory is located.

PERMANENT STORAGE: When you turned off the power to the computer, the information contained in RAM disappeared. If you want this saved permanently, you must record the information on tapes or disks. This involved copying the information from the RAM to the tape. This process does not disturb the information already in RAM. When you want the information back again, the process is reversed and the information on the tape is not disturbed.

PRINTERS: (What to Look For!) Microcomputer printers can be classified into two categories; dot matrix and solid typeface. The dot matrix printer uses a matrix of dots to form a character on paper. This paper could be either regular paper, special aluminized or heat treated paper. When the printer uses regular paper, the dots are formed by firing pins connected to solenoids through a ribbon onto the paper. If the printer uses special paper, the dots are small heating elements which either burn off an aluminum coating or change a dye. The solid typeface uses a ball (like a Selectric) or a wheel with each letter on a petal (like a flower). This wheel spins around and a little hammer hits the right letter as it goes by. This is called a daisy wheel printer. The dot matrix printer is faster and cheaper than the solid typeface, however, it does not produce the same character quality. Here are some things to look for in a printer:

- If it is a dot matrix, what is the density of the dots? A minimum of 5 x 7 or 5 dots across and 7 dots down. The higher the density, the better the characters look.

- Can it print lower case letters? The cheapest models can only print upper case. If the printer can print lower case, can it print g's, q's and y's with their tails below the line? These are called descenders. Many people find

that letters without descenders are difficult to read. Descenders are associated with higher dot matrix densities like 9 x 12.

- What is the speed in characters per second (CPS)? A dot matrix should be no slower than 30 CPS, the average seems to be 80-100 (CPS). However, don't just look at CPS figures. Do an actual count of how many 60-80 character lines can be printed in 15 seconds to get a lines-per-minute count (LPM). Some printers may have high CPS ratings, but have inefficient paper feed and carriage return mechanisms and thus may be slower than printers with lower CPS ratings. A printer that prints in both directions (bi-directional) will tend to be faster than one that only prints left to right.

- Listen to the printer. Could you put up with its sound for a whole day? Microcomputers are so marvelously quiet, why spoil your system with a screaming printer.

- For business purposes, try to get a printer that will print at least 80 characters across an 8 1/2 inch page. This is industry standard although some software may require 132 characters per line. Some printers can compress 132 characters into an 8 1/2 inch wide line.

- Does the printer use roll feed, sprocket feed (tractor feed) or single sheets of paper? Sprocket feed paper will be held straight while printing long reports or forms.

R-F INTERFERENCE: R-F stands for radio frequency interference, and all computers produce it. Although not dangerous, it can play havoc with your TV and FM reception. R-F interference shows up as a garbled noise on FM and a houndstooth pattern on TV screens. The farther out one gets in a TV fringe reception area, the worse the interference gets. There are very few effective remedies, but one of the simplest is to place the computer as far away from the TV antenna or antenna wires as possible. Making sure the computer is grounded helps as well. Contact the Federal Department of Communications for more information on solving this problem.

TAPES: The most common kind of tape storage is the normal audio cassette. This has the advantage of being cheap, but cassette recorders make you press the button and adjust the volume controls. For business purposes these cassettes have two disadvantages. They are slow because the tape only moves at 1-7/8 inches per second. This can be annoying when you have a large amount of data to transfer. However, the greatest problem is one of reliability; data can be easily lost using cassettes.

The next kind of tape unit is the tape cartridge. It is designed specifically for computers and is found in HP-85's and IBM-5110's. It is both fast and reliable.

WORD: A basic unit of computer memory. The length, the faster the machine can work to 60 bits. In general, the longer the word length, the faster the machine can work with numbers. Most microcomputers have a word length of 8 bits or 1 byte (now it is 16 bits, like a 4 lane highway vs. a 2 lane, more throughput).

LEARN TO PROGRAM IN BASIC

(No. 1, February, 1980)

The standard language of microcomputers is called BASIC. You enter your directions to the computer in this language with a series of sentences called statements. Each statement is given a number. The computer will go from statement to statement in ascending order of the numbers. Examples:

```
1 clean out the barn
2 fix the tractor
```

Indicate that you want the barn cleaned out before fix the tractor. The computer does not care what the numbers are just as long as the second one is larger. Example:

```
100 clean out the barn
2012 clean up
3574 have lunch
```

Thus, statement numbers give the computer the order of the things you want done. From the example, if you want to clean up before lunch, this sentence would be numbered between 2012 and 3574. Example:

```
2012 fix the tractor
3000 clean up
3574 have lunch
```

As you may have guessed, the above statements would probably mean nothing to the computer. We are going to learn some grammar of BASIC.

PRINT - This allows the computer to communicate with you by printing on the screen or the printer. To print something, you enclose it in quotation marks after the PRINT. Example:

```
to print HELLO! on the screen -
10 PRINT "HELLO!" is a program to do this. Everytime the computer prints something, the next print
statement will print on the next line. Example:
10 PRINT "HELLO"
20 PRINT "THERE"
will be:
HELLO
THERE
```

You can stop this happening by putting a semi-colon at the end of the first print statement. This will cause the

next piece of material to be printed in the next available space. Example:

```
10 PRINT "HELLO";
20 PRINT "THERE"
```

is HELLOTHERE - Note how it runs the words together. Question: How would you correct these statements so the words do not run together.

Answer: Put a space either after HELLO or before THERE!

```
(Example: PRINT "HELLO ";
PRINT "THERE"
is: HELLO THERE)
```

(No. 2, March, 1980)

Variables are the slots where the computer stores the numbers. This allows you to use any numbers you want. A program that could only use one set of numbers would be pretty useless. Now reach back into your memory for some algebra. Computers obey the same laws of algebra as we do.

The computer is just like a calculator; you plug in the numbers and it cranks out the answer. It cannot solve a system of equations unless it has been programmed to do so.

The symbols which BASIC uses are:

```
+ for addition
- for subtraction
* for multiplication
/ for division, examples 6/2 = 3
and ↑ or ** for exponentiation, example 3**2 = 9 (3 squared)
```

When the computer evaluates a formula, it will take the numbers and variables to the right of the equal sign, calculate the value and assign it to the variable to the left of the equal sign.

Let's write a program:

```
10 X = 2
20 Y = 4
30 Z = X * Y ** 2
40 PRINT Z
```

Several concepts were introduced here. We can write numbers as part of the program and assign them to variables. These numbers do not change and are called constants. The number calculated for Z is 32 not 64. The computer has a hierarchy of operations which it follows when it calculates equations: it is 1) parenthesis, 2) special functions (like logs), 3) exponentiation, 4) multiplication and division and 5) addition and subtraction. The use of parenthesis will change the hierarchy for example.

(X * Y) ** 2 will calculate X * Y first "8" and then square it to 64. Of course, you could have several levels of parenthesis with the deepest level done first, example ((X + Y) * X) ** 2 will do X + Y first, multiply by X and then square the result.

Finally we can print out the value of the number within the variable.

Thus if Z = 32 then PRINT Z will give 32, but PRINT "Z" will give Z (since everything within the quotes will be printed exactly as written). We also could have had 40 PRINT "THE ANSWER IS "; Z which would have printed THE ANSWER IS 32.

Now let's write a program which will give the value of \$1000 kept in the bank at 12% interest compounded annually for 10 years. The formula for this is:

$$FV = PV (1 + i)^N$$

where FV is the future value of the deposit, PV is the present value (\$1000), i is the interest rate divided by 100 (.12 or 12/1000) and N is the number of years the amount will be kept. The program would be:

```
10 P = 1000
20 I = 12/100
30 N = 10
40 F = P * (1 + I)**N
50 PRINT "THE FUTURE VALUE IS $";F
60 END
```

Problem: Rewrite the program so you can find what the present value of \$1000 paid in 10 years with an interest rate of 12%.

(No. 3, April, 1980)

```
Answer:
10 F = 1000
20 I = 12/100
30 N = 10
40 P = F / (1 + I)**N
50 PRINT "THE PRESENT VALUE IS $";P
60 END
```


The statement that allows the computer to get information from you is:

INPUT varlist

The varlist may be one variable or several separated by commas. Example INPUT A or INPUT A,B,C.

The computer will print a question mark on the screen and wait for you to type in the number. However, if the program has a list of variables, you must enter in each value separated by a comma. Example, when the computer executes INPUT A,B,C - you must type in 25, 37, 50 after the question mark to fulfil the requirements of the statement. The statements:

```
10 PRINT"ENTER YOUR AGE"
20 INPUT A
```

will look like:

```
ENTER YOUR AGE
?
```

on the screen.

If you wish the question mark to be on the same line as the question, end the question with a semi-colon ";". This will cause the question mark to be printed on the next available print position. Thus:

```
10 PRINT"ENTER YOUR AGE";
20 INPUT A           gives: ENTER YOUR AGE?
```

If you rewrite the future value program so that you can plug in any values, replace lines 10 to 70 with:

```
10 PRINT "ENTER THE PRESENT VALUE";
20 INPUT P
30 PRINT "ENTER THE INTEREST RATE"
40 INPUT I
50 I=I/100
60 PRINT "ENTER THE TERM IN YEARS";
70 INPUT N
```

The program continues on as before.

(No. 4, May, 1980)

Programs work from the first instruction until they end or run out of instructions. The ability to change the flow of a program is called branching. There are two kinds of branching - conditional and unconditional.

CONDITIONAL BRANCHING: Assume you are deciding what kind of wine to buy for supper (a favorite topic). Generally, red wine goes with beef while white wine goes with fish or poultry. Thus in the liquor store, you say to yourself:

```
if we are eating beef, then I will buy red wine
if we are eating fish or poultry, then I will buy white wine
if we eat none of the above, then I will buy beer
```

The conditional branch in BASIC says - IF a condition is true, THEN branch to a line number. If the condition is false, we drop through to the next line. What exactly is the condition that can be true or false? It is when a variable is equal or less than or greater than a number. The symbols BASIC uses are:

```
= for equals
< for less than, example: 3 < 5
> for greater than, example: 5 > 3
< = (or = < ) for less than or equal to
= > (or > = ) for greater than or equal to
< > (or > < ) for not equal to
```

Let's construct a program using conditional branching to print out the odd numbers between 1 and 50:

```
10 N=1
20 PRINT N
30 N=N+2
40 IF N < 50 THEN 20
50 END
```

Line 40 asks if N is less than 50. If it is, then we branch to line 20 which prints N. Line 30 increments N by 2 and then the question is asked again. When N reaches 51, it no longer meets the condition of line 40. The program falls through to line 50 and ends. Thus on a conditional branch, one can go two ways.

1. Meet the condition and branch to a line, or
2. Fall through and execute the next instruction.

This month's question:

Rewrite the future value program so that it evaluates the future value of \$1,000 for 10 years using interest rates from 10% to 20% inclusive. (10%, 11%, 12% etc.)

```
Answer:      10 P=1000
              20 I=10/100
              30 N=10
              40 F=P*(1 + I)**N
              50 PRINT "THE FUTURE VALUE IS$";F
              60 I=I + .01
              70 IF I < .20 THEN 40
              80 END
```

Note that we add .01 to I because I is now divided by 100.

No. 5, June, 1980

UNCONDITIONAL BRANCHING: Conditional branching gave the program a choice on whether to branch or not. Unconditional branching always makes the program branch. The format of this statement is:

GOTO line number

The GOTO statement is often combined with the IF THEN statement. For example, let us say you have a decision point where either you do one block of lines or another complete block of lines but not both. It looks like this:

```
      10 IF A=I THEN 2000
      20 }
      ↓ }      these lines done if A≠I
      1000 }
      2000 }
      ↓ }      these lines done if A=I
      3000 }
      4000 }
      ↓
      rest of the program
```

What happens when you have finished the lines ending at 1000? You will then start to execute lines 2000. But you should only do this when A=I! To get around lines 2000 to 3000 you insert a GOTO 4000 at line 1010. This will branch around lines 2000 to 3000.

This month's question:

This is a hard one. Rewrite the future/present value programs (see Vol.I, No. 3) so that they take in the years and interest rate from the keyboard. Ask if you want present value or future value (hint: enter a 1 for present value) get the appropriate input and calculate the answer. Then ask if the user wants to run the program again with 0 for No. 1 for YES.

```
      10 PRINT "ENTER THE INTEREST RATE";
      20 INPUT I
      30 I = I/100
      40 PRINT "ENTER THE TERM IN YEARS";
      50 INPUT N
      60 PRINT "ENTER 1 TO CALCULATE PRESENT VALUE, 0 FOR FUTURE VALUE";
      70 INPUT T
      80 IF T = 1 THEN 110
      90 IF T = 0 THEN 160
     100 GOTO 200
     110 PRINT "ENTER THE FUTURE VALUE";
     120 INPUT F
     130 P = F/(1 + I) ** N
     140 PRINT "THE PRESENT VALUE IS $"; P
     150 GOTO 200
     160 PRINT "ENTER THE PRESENT VALUE
     170 INPUT P
     180 F = P * (1 + I) ** N
     190 PRINT "THE FUTURE VALUE IS $"; F
     200 PRINT "DO YOU WANT ANOTHER? 1 = YES, 0 = NO"
     210 INPUT T
     220 IF T = 1 THEN 10
     230 IF T = 0 THEN 250
     240 GO TO 200
     250 END
```

Note the sequence of lines 80 - 100 and 230 - 250 excludes any other answer but 1 or 0, this is called idiot proofing.

LOOPING: The sequence $I = 1, I + 1, \text{IF } I = N, \text{ THEN line \#}$ is a way of executing a set of statements more than once (N times in fact). We did this in June's exercise. BASIC has a statement which allows us to define these loops in an easier manner. It is:

FOR (variable) = (number or variable or expression) TO (number or variable or expression) STEP (number or variable or expression)

From the above, the statement is FOR $I = 1$ to N STEP 1. However all machines assume to STEP is 1 if you leave it out, thus FOR $I = 1$ to N will do the job. There is a second statement to the loop. It is NEXT (variable). This tells the machine the end of the statements you want to loop around. Let's go back to May's question.

```
10 P = 1000
20 N = 10
30 FOR I = .1 to .2 STEP .01
40 F = P * (1 + I) ** N
50 PRINT "THE FUTURE VALUE IS $";F
60 NEXT I
70 END
```

We could have written 30 & 40 as 30 FOR $I = 10$ TO 20

40 $P * (1 + I/100) ** N$

We can also do loops within loops. For instance, to calculate some combinations of interest rates and terms one could have:

```
10 P = 1000
20 FOR N = 1 TO 10
30 FOR I = 10 TO 20
40 F = P * (1 + I/100) ** N
50 PRINT "THE FUTURE VALUE IS $"; F
60 NEXT I
70 NEXT N
```

Note that lines 30 - 60 compose the inner loop and lines 20 - 70 compose the outer loop. The order of calculations will be all interest rates for each term e.g. $N = 1, I = 10 \dots 20, N = 2, I = 10 \dots 20$. It is very important that the NEXT statements follow the proper sequence. Thus the inner loop NEXT must come before the outer loop's NEXT. An easy way to check for this is to draw a line from each FOR statement to its corresponding NEXT statement. If the lines cross then you do not have the proper order e.g.

```
FOR N =
NEXT N =

FOR I =
NEXT I =
```

This month's question:

Devise a table that calculates net price after allowance for cattle shrinkage in dollars per hundred weight, from 65 - 70 dollars in 50 cent increments with shrinkages of 2, 4, 6, and 8 percent. Layout the table so that shrinkage percentage is across the top and base prices run down the side. e.g.

Base Price	Shrink %	2	4	6	8
65	63.7	63.7	62.40	61.10	59.80

Answer:

```
10 PRINT "Base Price Shrink %"
20 FOR X=65 TO 70 STEP .5
30 PRINT " ";X;" "
40 FOR Y=2 TO 8 STEP 2
50 PRINT X-X*Y/100;" ";
60 IF X < > 8 THEN 80
70 PRINT " "
80 NEXT Y
90 NEXT X
```

Note lines 60 and 70 are to make sure that the next price starts on a new line. Thus, if $Y=8$ (the last shrink percentage) line 70 prints without a semicolon, in effect doing a carriage return/line feed.

LEARN TO PROGRAM IN BASIC (No. 7, August, 1980)

This month we will clear up some details about printing, branching and variables. In the answer to last month's question, we printed spaces to have some separation between the different numbers. This allows us to have FORMATTED OUTPUT which looks pleasing to the eye. There are shortcuts which allow the same effect. The first is the TAB function. Its syntax is:

TAB (number, variable or function) e.g. TAB(10) TAB(X) TAB($X-Y*5$)

The value within the brackets is the column at which the printing is to commence from. In the above program, line 30 could have been written as:

```
30 PRINT TAB(3) ;X;TAB(19);
```


Since printing columns of numbers usually requires that the numbers line up either the decimal points or the first characters (called left justified), judicious use of TABS can do this. There is also an easy way to line up numbers if there are not too many columns. One can use a comma instead of a semi-colon in the print statements. The comma will cause the computer to tab over to its internal pre-set tabs, usually 8-14 spaces apart.

We had always used a conditional branch as IF (condition) THEN (line #). Most microcomputer BASIC's allow the syntax IF (condition) GOTO (line #). The IF-THEN statement can be used for more powerful uses, the executable conditional. This allows any statement to follow the THEN (and in most machines which allow multiple statements, more than one 0. For instance, look at the answer to June's question. Line 230 was IF T = 0 THEN 250 Where 250 was the END. We should have been able to say IF T = 0 THEN END and saved one statement. The fewer the branches, the more readable the program becomes.

The final concept we will explore is the STRING VARIABLE. This variable stores letters (and digits) instead of numbers. Up until now we have written programs that used numbers exclusively. Of course these are not the only things you will want to store with a computer. Names, dates, places and things are some of the possibilities. A string variable is designated by a dollar sign after the letter(s) e.g. A\$ B1\$ AA\$ One assigns the letters or digits (called alphanumerics) to the string variable with an equals sign e.g. A\$="hello" The alphanumerics must be enclosed in double quotes just like a print statement. You can make one string equal to another A\$=B\$ and do comparisons on them IF A\$="GARY" GOTO 250 Now you can answer yes or no to questions rather than 1 or 0.

LEARN TO PROGRAM BASIC (No. 8, September, 1980)

This is our last lesson of the series. This month we will cover the subroutine. The subroutine is a set of lines that could have been duplicated several times through the program, but are instead collected into one group.

```
For Instance:      500 INPUT X
                   510 IF X < = 0 THEN 540
                   520 IF X > 100 THEN 540
                   530 GOTO 570
                   540 PRINT "SORRY THIS IS NOT CORRECT!"
                   550 PRINT "TRY AGAIN"
                   560 GOTO 500
```

This routine will place limits on the value of X. Here X is a percentage figure between 0 and 100% (actually 0% is not acceptable either). If you had 25 inputs, all with pre-determined limits, you would have 175 lines just for this function alone. The same 7 lines of code would be repeated for each question. However, these lines are the same except: 1) the variable inputted will change and 2) the upper and lower limits may change. The procedure we can use to economize on lines is the subroutine. Its syntax is GOSUB line number in the main program with the end of the subroutine marked by RETURN. The line number is the first line of the subroutine. In our example, the main program has:

```
500 H=1000
510 L=0
520 GOSUB 2000
530 X5=X
```

We have defined the limits with H and L. Why line 530? Because the GOSUB returns with a value for X, we have 25 different variables into which the value of X must be transferred. The subroutine is:

```
2000 INPUT X
2010 IF X < = L THEN 2040
2020 IF X > H THEN 2040
2030 RETURN
2040 PRINT "SORRY THIS IS NOT CORRECT!"
2050 PRINT "TRY AGAIN"
2060 GOTO 2000
```

Notice the RETURN does not have to be the last statement in a subroutine. Logically though, the RETURN is the last statement in the subroutine since this is the only way to exit back to the main program. When you return from a subroutine, the line after the calling line (which has the GOSUB) is the next line to be executed (line 530 here). In our example, we have saved 68 lines by using this subroutine. Just remember, the more a program jumps around either by subroutines or gotos, the more unreadable it gets. It may not be a problem to you, but somebody else that may use the program can have no end of troubles figuring it out.

CONTACTS (No 1, February, 1980)

Here are some Departmental contacts who are willing and able to give advice on the farm management uses of computers.

Bruce Waldie: Farm Business Management Branch
Box 2000, Olds, Alberta T0M 1P0
Paul Gervais: Telephone: 556-4240 / RITE 154-1240

George Monner: Regional Economics and Business Services Branch
Fairview, Alberta
Phone: 835-2241

Echo McCarley: Computer Services Branch
Regional Office, Agriculture Centre, Lethbridge, Alberta, T1J 4C7
Telephone: 329-5530 / RITE 181-5530

OR YOUR LOCAL DISTRICT AGRICULTURIST/REGIONAL FARM ECONOMIST

Besides accounting systems, what other software might be useful with an on-farm computing system?

Another useful package would be something to help you do table based plannings such as partial budgets, cashflow analysis or ration balancing. All of these applications require you to fill out rows and columns on a piece of paper and add them up. Programs exist which allow you to define a table of numbers and do any kind of transformation on them. If you change any number in the table, all the totals are immediately recalculated. This allows "what-if" analysis to be done very easily. If you were doing a five year cashflow and wanted to inflate the fuel cost by 15% in each year, a simple command could do this and give the new totals for each year. The data can be stored on disk for later use. An example of this kind of program is VISICALC(TM) which runs on APPLE systems (soon to be on others).

COMPUTER MAGAZINES (No. 5, June, 1980)

BYTE:

- Subscription Department, Box 590, Martinsville, New Jersey, U.S.A. 08836
- Monthly- \$23 (US) per year
- Notes: - can be very technical sometimes
 - has the largest circulation

MICRO COMPUTING: - P.O. Box 997, Farmingdale, New York, U.S.A. 11737
 - Monthly - \$18 (US) per year
 - Notes: - has a lot of do-it-yourself articles

PERSONAL COMPUTING - 1050 Commonwealth Avenue, Boston, MA, U.S.A. 02213
 - Monthly - \$18 (US) per year
 - Notes - not as "heavy" as others
 - more games oriented

CREATIVE COMPUTING - P.O. Box 789-M, Morristown, New Jersey, U.S.A. 07960
 - Monthly - \$19 (U.S.) per year
 - Notes - lots of review games and programs
 - department for PETS, TRS-80 and APPLE

POPULAR COMPUTING - Subscription Department, Box 307, Martinsville, New Jersey U.S.A. 08836
- Quarterly - \$13.97 (US) per year
- Notes - for beginners
- from the same people who publish BYTE

For the TRS-80: COMPUTRONICS one year \$30 (US)
Box 149
New York, N.Y.
U.S.A. 10956

This month I will outline some magazines that come on a cassette and contain programs and news. The programs are mostly games but there are some serious gems as well. In any case, the programs are of professional quality and well worth the subscription price. However, there is one rub, the cassette may get x-rayed going across the border and become impossible to load. Slight differences between cassette recorders may also make loading difficult.

APPLE: Softside: Apple
P.O. Box 68
Milford N.H. 03055
Monthly? \$69.50/6 months

Notes: Only available on a diskette, hence the cost.

PET: Cursor Magazine
Box 550
Goleta, CA 93017
\$27.00/6 issues

Notes: A steal at this price!
(check the magazines for new magazines on disk or cassette).

THE CAT'S OUT OF THE BAG

In his column published in the weekly papers, the Minister of Agriculture announced the intention of the Department to start a service called AAPAC (Alberta Agriculture Programmed Access To Computers).

What will this system do? Its main function is to provide information. We print thousands of pages of information every year. It is getting increasingly difficult to sort out what is important to your own situation. AAPAC will let you review summaries of reports selected by subject. After selecting this report, you can then read the in-depth material within it. AAPAC will disseminate more current information like weather and market reports. It may keep ROP, DHI and many other kinds of records for you. It will contain many programs which can help clarify the common (or uncommon) decisions made in the business of farming.

"Great", you say, but when will this happen. If approved by cabinet, the intention would be to put a terminal in every district agriculturist office including many other locations in the department. This could number 400 terminals in all by 1985. By 1990, farmers will be able to tie into the system. Therefore, (according to present plans) don't expect anything until after 1985 at least.

Can we plan for this in our present hardware purchases? Probably, but we don't know how the information is going to be carried. There are two ways possible right now. The first, is on a large computer time sharing system like IBM or CANFARM. You would dial the number of the system and use your computer as a terminal. Any micro can do this with the addition of a modem which transmits and receives digital codes which are carried over the telephone lines. The only thing you might look for (if you are buying a new computer) is the size of the screen display. If the screen can display 80 characters per line by 24 lines, the chances are you will receive tables from AAPAC without annoying wrap-around. This is where the remainder of a line too long to be displayed is placed on the next line. Example:

```
1 2 3 4 5 6 7 8 9 10
```

vs.

```
1 2 3 4 5 6 7 8
```

```
9 10
```

However, if information is carried on a system called TELIDON, the problems are greater. You will need a special color T.V. monitor to display the information. Either a special terminal must be used or a special program entered into existing micro systems. Technically, this system is very attractive since it has color and high speed data transmission. The moral here is to ask the computer salesman if the hardware will work with TELIDON, but don't base buying decisions on this fact alone.

I must repeat that AAPAC is a proposed system. There are many financial hurdles to clear before it can start development. Being a long term project, of at least five years before farmers can use it directly, do not let it interfere with your computer use plans in the short term. It is not meant to compete with farm computing systems, but to enhance their capabilities. (The grassroots telidon system may speed up the process of AAPAC).

THE HOMESTEAD FARM MANAGEMENT INFORMATION SYSTEM:

Part I: This is the first part of the promised review of this system; it will cover the hardware and the accounting system.

The Hardware: The Homestead comes with three separate components. The first is the microcomputer box which is a re-labeled Vector Graphic MZ. This is a S-100 buss computer and as I previously stated, this is the most versatile way of building a micro. It contains 56k of user RAM memory and two floppy disk drives of 315k storage a piece. The second component is a terminal with an 80 character by 24 line display, full typewriter keyboard and separate numeric keypad for number entry. The third component is a printer, a re-labeled Digital Equipment Decwriter IV, which uses wide roll paper and has a speed of 30 characters per second. It has a keyboard attached to it although all data entry goes through the terminal. It has a high density 9 by 7 dot matrix print head, but does not print lower case descenders.

The start-up procedure is to turn on all three machines (a power bar with a single switch may be more convenient) and insert the system diskette into drive 0. Hitting "B" on the terminal keyboard loads in the main menu screen which asks if you want:

- | | |
|------------------------|--------------------------------|
| 1) accounting system | 2) record keeping system |
| 3) management programs | 4) journal/data backup routine |
| 5) end session | |

For the accounting system, you insert your journal diskette into drive #1, hit 1 and return and control passes to the accounting system. The disks used on this system are 5 1/4", but are a special kind called 16 hole hard sector. Each sector position is thus marked with a hole punched in the diskette. What this means, is that disks that are sold for most popular brands like TRS-80, APPLE, PET, etc. will not work in this machine. You must buy these disks from Homestead or a computer shop. Once the system was set up and minor technical problems ironed out, it has since run without any errors. I think that two keyboards for the system is a bit much. I believe later versions are omitting the keyboard on the printer. As a general comment, I like their system of presenting a menu for each decision point. However, when presented with a list of 10 items, or less, you should be able to hit the digit you want and not have to hit return. This is called a live keyboard and it cuts the number of keystrokes in half as well as speeding up operation of the system. These are but minor oversights, the basic hardware is easily expandable to more disk storage and could be used as a terminal with the addition of a modem.

The Accounting System: The accounting system allows you to create up to 200 accounts and subaccounts. There can be up to six separate enterprises where transactions can be allocated. One disk can hold up to 1250 transactions. The opening menu displays:

- 1) transaction update routine
- 3) year-end routine
- 5) maintenance routine

- 2) month-end routine
- 4) financial report
- 6) general ledger and journal listings

If you choose the transaction update, the menu will ask if you want a revenue, expense, current asset, fixed asset, liability or net worth transaction. Once the type of transaction is chosen, the computer puts a form onto the screen and leads you around these questions: date, amount, details and enterprise allocation. The enterprise allocation can either be a standard set for that item or changed. After the primary transaction is completed, a secondary transaction must be entered and must be balanced with the primary one. In the example data we used, for an expense transaction, one could balance with cash or accounts payable. The system does not have aged accounts nor does it print cheques. The month-end and year-end routines close out the current balances in the ledger accounts. It then prepares a new diskette for next month's operation. I would recommend that you keep a separate disk for each month. The financial statements produce a balance sheet and a profit and loss statement. These can be either for the whole farm or any combination of enterprises. The reports can be printed with or without account numbers and on the terminal or printer. The file maintenance routine allows one to change account names standard allocation of transactions to enterprises and enterprise titles. The full general ledger or any transaction account for the current month can be listed. A net income statement that included inventory change and depreciation was sorely missed. Actually, on the system I tested, there was a section for accrual adjustment which was not available for conventional cashflow statement with sources and uses of funds might also be hand.

Overall, I would consider the accounting system to be easy to use and correct its accounting practice. The inclusion of enterprises and transaction balancing are its best points. The lack of a wider range of reports is its weakest point. (Homestead is still around and runs on the IBM P.C. It has been changed and upgraded over the years and looks very different).

(No. 10, November, 1980)

HOMESTEAD REVIEW

Management Routines

The opening menu of the management routine displays the following index:

1. Feedlot Simulation For Beef Cattle
2. Farrow To Finish Hog Analysis
3. Crop Production And Marketing
4. Ration Analyzer For Feedlot Cattle
5. Beef Cow Maintenance And Least Cost Feed Formulation
6. Financial Planning Of The Farm Operation
7. No Other Farm Management Simulations

The feedlot simulation for beef cattle starts by asking you whether you wish to use last session's inputs. If you say no, the program asks for starting and finishing weight of the animal, rate of gain and length of time for weight ranges. Once the above inputs were given, the program then provides a nutritional needs table for each weight range. Further questions asked are: what feeds to analyze (you may choose a maximum of five feeds), the cost of them and the minimum and maximum amount you wish to feed. A nutritional compositions table by feed is then presented. Next, a least cost ration table is presented by weight period. The program then progresses to ask for expenses, expected profit and revenue from the sale of the finished animal. The program ends by calculating the amount to pay when purchasing an animal at the starting weight. An area of concern in this program is the inflexibility of weight ranges. Also, an area that should be looked at more closely, is the least cost ration formula. It seems that some feeds may have a too high or too low percentage in the ration.

Farrow To Finish Hog Profitability Analysis

This program starts by asking what enterprise you want to analyze - farrowing, finishing or both. Some of the inputs you provide to achieve a profitability statement are: Number of sows and boars, rate per litter, percent of death loss, days to wean, expenses per pig (these are itemized individually such as veterinarian, transportation cost, etc.), cost of ration, selling price per pig, weight and rate of gain. Once all this information is stored, the computer totals feed expenses per day into either of the following categories: gestating sows, lactating sows, boars, pre-starters, growers and finishers. Total feed costs are then added to other costs giving a total expense per market hog and profit per pig. The only drawback I foresee in this program is that expense items may be too general to some people, although the program seems to be well thought-out. A minor item that may annoy people is that everytime input numbers are entered in the program, one must verify whether the numbers are right.

Crop Production And Marketing

The crop production and marketing program is a very long program. It starts by asking planting intentions, i.e. acres planted and yields to expect. The above is then presented in table form. Next, fixed annual costs are asked for by specific item. Fixed annual costs are then summarized in per seeded and cultivated acre. Operating costs per grain crop are also asked. (Included seed, fertilizer, chemicals and insurance) and presented per crop and acre. Next, a break-even table is printed itemizing each crop and the minimum return required to recover total cost per crop. After this, a table of net value of production per crop is printed. The first marketing summary asks in which market you are going to sell your crop (board, non-board, domestic or contract) at what volumes and price. The above is presented in a table. Next a grain volume table is printed which includes production, sales and inventory.

The final two tables present gross dollar value and unit comparison (production cost per crop and acre, total marketsales per crop and acre and net results per crop and acre. The above program seems to be a well thought-out program that provides a very detailed crop production and market analysis.

Beef Cow Maintenance And Lease Cost Feed Formulation

This program is very similar to the feedlot simulation program. It calculates the least feed cost per type of cow (pregnant or lactating) for a specific weight of cow and length of time. This program does not take into consideration other costs associated with beef production. The ration formula should be re-evaluated.

Other programs on management routines were not available at the time of evaluations.

(No. 10, November, 1980)

TELIDON IS HERE (ALMOST)

In the middle of October, I had the privilege of attending a demonstration of the TELIDON videotex system. This is a method whereby pages of color pictures or text are sent over fibre optic lines or cable T.V. lines or phone lines. The equipment consists of a specially modified T.V. set (called a Red-Blue-Green monitor), a microcomputer (which translates the signals) and a keypad which allows the user to interact with the system. The user selects what he wants to read either by going through a series of menus or by keying in the page number directly. The page returns and is drawn on the screen as though someone were using a paint brush. The amount of text information that can be displayed on a screen is about 20 lines of 40 characters per line. Technically, this system is one of the most advanced in the world, the color graphics are excellent. Many people are saying that this will be the home utility of the future replacing television, certainly the concept is intriguing. At your fingertips would be a library full of information from the weather in B.C. to Chicago pork belly prices. With a typewriter keyboard, you could have almost unlimited data processing capabilities. Electronic mail decision models and private data storage are just a few possibilities, but I have been speaking only of possibilities, what of the realities. The most ambitious TELIDON project is being carried out by Manitoba Telephones System and a private firm called Infomart. Infomart intends to start a pilot TELIDON system called Grassroots in 23 small Manitoba communities (by April 1, 1980). One terminal will be placed in each of these towns to monitor public response. Manitoba Agriculture, the Winnipeg Commodity Exchange and other business firms have expressed some interest in providing screens of information onto the system. Thus, Grassroots will act much like a magazine which is free except for postage charges. Infomart will bill information providers a fixed charge per page of information.

The project is only the start of a commercial venture which will expand west to Alberta.

(No. 11 - December, 1980)

REVIEW OF HARDWARE

Asking the right questions in evaluating hardware and software may at times be difficult. To help you in reviewing this issue, a hardware checklist is at the back of this newsletter. A software checklist will be in next month's newsletter. When coming to the computer fair, these checklists may help you in comparing systems.

COMPUTER

Memory Size (k bytes)? - (32k is recommended)
How much memory can be added: (cost?)
Size of RAM? (The greater, the more versatile)
Size of ROM?
Screen Size? (80 x 24 character is recommended)
Video Display - black and white or color?
Requires T.V.?
Keyboard has upper-lower case?
Number pad? (Is recommended)
Graphics?
What language(s)?
Number of commands?
Number of statements?
Number of functions?
Error messages?
Meets federal radio frequency interference standards?
Built in audio?
Serial and communication interface?
Popular brand? (Greater the population, greater the amount of software)
Price?

DATA STORAGE

Kind of data storage? (Tape and/or disk - disk is recommended)
Number of disk drives? (Two are recommended)
Storage capacity of diskettes?
Diskette size?
Price of cassette unit?
Price of disk drive(s)?

PRINTER

Dot matrix or solid typeface?
What size is the dot matrix? (The larger, the better)
Lower case and descenders? (Descenders recommended)
Speed of printer? (80-100 recommended)
Bi-directional?
Noise Level?
Roll feed or sprocket feed?
Serial or parallel interface?
Price?

BEST OF VOLUME 2

(No. 1, February, 1981)

REVIEW OF SOFTWARE

Software is a vital part of any computer. Software controls the computer and its peripherals and instructs the system to do your work the way you want it done. When buying software, the checklist below may help in evaluating and asking questions.

SOFTWARE CHECKLIST

General

Does it do all that I want it to do?
Memory needed?
Can the program be altered?
Backups, can I make them?
What language?
Printer required?
Available on cassette or diskette?
Users Manual
Technical manual?
Documentation adequately indexed?
Extent of training and vendor support?
Error correction procedure is simple (built-in accuracy checks)?
Does return key have to be used for each entry?
How many disks are needed?
Terminology is clear and understandable?
Price?

Inventories

Has crop inventory listings?
Has livestock inventory listing?
Has machinery inventory listing?
Has building inventory listing?
Are these communicated to financial side?
Can these be allocated by different owners?
Ease of change?

Records, Accounting & Budget

Has income statement?
Has net worth statement?
Has cash flow report?
Has balance sheet?
Depreciation schedule?
Capital purchases and sales?
Summary of principal and interest payments?
Provides for recording intrafarm enterprise transfers?
Single or double entry?
Number of accounts?
Number of journal entries per month?
Are journal entries stored on diskettes?

Breeding Records

Can retrievals be made on any attribute?
Can animals be sorted by attributes?
How many additions and changes can be made?

Crops and Livestock Records

Volume of business?
Efficiency in production (yield/acre, returns per \$100 feed fed, etc.)?
Efficiency in buying and selling (price paid vs. price sold)?
Marketing summary?

(No. 2, March, 1981)

THE COMPUTER FAIR - Seminar in Olds on February 24 & 25 had a tremendous turnout (300 +) despite inclement weather. The majority of the exhibitors were impressed with the public's interest and the questions directed at them. There were twelve exhibitors displaying hardware, software, mobile radios and video equipment. The interest shown by both the exhibitors and the public has demonstrated the need for another Computer Fair next year.

For those who were not fortunate to attend the Fair, below is a brief outline of events.

BEARPIT - Bill Thomsen

Bill is a Cominco fertilizer dealer from Rolling Hills, Alberta. The session demonstrated the use of VISICALC, a table generating program which can take tables up to 254 rows by 64 columns, depending on memory. The worksheet takes on either values or labels. Values can be easily added, subtracted, divided or multiplied. If one value changes, VISICALC can automatically recalculate your totals. Thus, what you can do with paper, pencil and eraser, you can do with VISICALC, but more quickly, efficiently and accurately without formal programming. Bill said it is a must for any computer on the farm. Some of the programs that were demonstrated during this session included cash flows, partial budgets and fertilizer blending mixes. Another advantage of that is a universal language for microcomputers. A typed in model listing will run the same on a TRS-80, APPLE and COMMODORE PET. The demonstrator hardware (APPLE II) was provided by Computer & Video Centre, Red Deer. To display the screen, Western Cinevision presented the Electrohome EDP-56 (once it thawed out). This projector can project full computer screen to a size of 10 x 10 feet, which is helpful in demonstrating computer programs to a large group.

The proposed service is to give computerized access information to individuals when they want it, how they want it and in the form they want it. This information would include marketing information, electronic mail, weather, animal and crop information, plus much more. If the system is implemented, the time frame for outside user access is between 1985 and 1990. The reason for such a delay is to work out problems such as standardization, access capacity and communication access (phone list). In addition, research has to be conducted to determine who is going to use the system, how many individuals will use it, and what information will be retrieved. Although most of us prefer to have the system today, patience will have to prevail in order for the system to run smoothly in the future.

SEMINAR - CAN YOU ROLL YOUR OWN SOFTWARE?

Doyle Wiebe & Murray Gleim

Doyle Wiebe (programmer) and Murray Gleim (financial management consultant) of Farmfax gave a seminar dealing with three basic areas: 1) The write/purchase decision, 2) structure of both the programming effort and the program itself, and 3) various methods of testing a program.

In the write/purchase decision, first time users of micros usually have an inaccurate conception of time and cost. Rapid response and flexibility are usually not achieved when it comes to programming. Considerations for a particular computer application are: 1) Is there already a commercial software package available that will do the job? (justify the cost) 2) Can you afford the time to develop a program? 3) If you are writing your own program, you will have to decide what level or error checking you want. 4) Who is the day-to-day user of the program? Proper documentation needed of the home-brewed program is to be run by someone other than the author. 5) The personal satisfaction of writing a program.

Thus, if one has decided to write a program the basic activity of any planner is to classify and categorize the different phases of the process and the different levels of a finished program. Phase one - purpose and goal determination (program specification). Phase two - design of the program, (including flow charts). Phase three - writing the program for a particular machine and debugging it. Phase four - Testing and using the program. Designing a program is a methodical top-down sequence. Top - the main program and initialization statements. Near top - program module or main sub-programs. Near bottom - data, reads, print, calculations and other subroutines. By outlining the program in the above way, you will have documented the part and phases in a methodical way.

Other things to take into consideration when writing a program are: 1) formal structuring - needed in order to follow its logic from the program listing, 2) syntactical design - you will save yourself many frustrating hours of debugging syntax errors in program coding if you know the rules and regulations of your micro's version of BASIC, 3) intelligibility - unintelligible, unstructured programs usually appear disconnected and hard to read and understand, 4) systematic organization - a well laid program with similar problems, solved uniformly, will have minimal debugging, 5) story elements - written as a story with a clear plot, argument and goal.

The first level of testing a program is the testing of the various logic modules within the program. Examples of this are: 1) checking to see if all inputs are accounted for, 2) checking to see that all files are closed at the end of the program 3) checking to see that all our subroutines end with return command, etc. The next level of testing is the actual program testing. Some methods available are: 1) simulated logic or desk checking - you test by tracking through the program with a mental representation of a transaction, 2) random data - the programmer prepares a series of transactions primarily to see if a program will execute, 3) live data - programmer uses actual transactions to test the program, 4) production testing - inputs are processed to check if outputs are correct and if not rerun with new inputs, 5) controlled testing - here each type of input transaction is prepared for all the permutations that its data fields can include in order to find invalid or extraordinary situations.

A copy of this speech can be obtained from this branch on request.

BEARPIT - John Stewart-Smith

John is a rancher who started using a computer on a time sharing basis but later converted to an in-house mini computer. One of the problems of a time sharing system is the availability of computer time. To John, immediate access time to a computer was important, thus one reason for switching. He did stress the importance of knowing what information you want to record and retrieve. If you are not exactly sure, he suggested that leasing a computer and its program for a while may avoid disappointment and help in determining what you want out of your programs. When buying a computer, research the market (just as one usually does when buying a tractor) in order to find the computer and its programs that suit you. He also pointed out that you should not worry about the computer and its program being out-dated in a few years. If the computer and its program do the job, then how can it be out-dated? If you know your term plans for computer application, the computer will be of most benefit.

WORKSHOP - Diane Dearing

These workshops dealt with the familiarization of computer jargon and the computer itself. After introducing people to the above, development of computer questions, alphanumeric functions, and sample programming was undertaken. A small program was devised in which sums and averages of numbers could be calculated by computer.

HIGHLIGHTS

Highlights of the Fair were VISICALC demonstrated by most exhibitors and the Source access. The Source is a time shared computer aimed at small users. It is based in McLean, Virginia, on the outskirts of Washington, D.C. The Source makes its computer data bank and electronic mail service available 24 hours a day. Low rates are in effect after 6 p.m. and throughout the weekend and holidays.

Besides electronic mail, the Source offers: air schedule business and financial information (stock market quotations, commodity reports, etc.); classified ads, electronic "mail-order catalog", education programs; energy saving news,

and games. Most important, the United Press International News stories as they come over the wire can be searched by name, subject, date or any combination.

Another note of interest was the number of farmers who were either using or were thinking of using an APPLE computer in the future. Disappointments at the Fair were the failure of Radio Shack and Canfarm to show up.

Overall the Fair was a success and opinions and ideas for a similar Fair next year are greatly appreciated.

SOME COMPUTER SHOPS IN ALBERTA

Alpha I Micro Consulting Ltd.
14206 - 128 Avenue
Edmonton, Alberta
T5C 3H5
Ph. 454-8409
Sells Radio Shack and Apple

American Computers and Engineers
Deerfoot Business Centre
230, 6715 - 8th Street N.E.
Calgary, Alberta
T2E 7H7
Ph. 275-5871
Sells Cromemco, IBM

Chinook Recreation
1509 - 3rd Avenue S.
Lethbridge, Alberta
Ph. 327-8000

Computer Innovations
723 - 14th Street N.W.
Calgary, Alberta
T2N 2A4
Ph. 283-0751
Sells IBM, Apple & Nabu

Computer Innovations
10411 - 124th Street
Edmonton, Alberta
Ph. 482-5625

Computerland of Edmonton
10510 - 82nd Avenue
Edmonton, Alberta
T6E 2A4
Ph. 433-1491
Sells Apple, Atari, IBM & Osborne

Corvec Data Systems
201, 10601 Southport Rd. S.W.
Calgary, Alberta
T2N 3M6
Ph. 271-3421
Sells Vector Graphics

Galactica Computers Ltd.
10021 - 103 Avenue
Edmonton, Alberta
T5J 0H1
Ph. 429-1426
Sells Apple, Cromemco hardware & software,
also TRS-80 software

Hindson Computing Systems Ltd.
7144 Fisher Street S.E.
Calgary, Alberta
Ph. 252-9576

IBM Product Center
10060 Jasper Avenue
Scotia Place
Edmonton, Alberta
Ph. 426-7867

Computer Innovations
5809 Macleod Trail S.W.
Calgary, Alberta
T2H 0J9
Ph. 252-6608
Sells Apple, Nabu, Cromemco, IBM

Computer Shop
3515 - 18th Street S.E.
Calgary, Alberta
T2T 4T9
Ph. 243-5005
Sells Commodore, Apple, North Star, TI, Atari

Computer Shop
4404 - 12 Street N.E.
Calgary, Alberta
Ph. 230-1446

Computer World
4921 - 49 Street
Red Deer, Alberta
Ph. 347-4280

Computerland of Calgary
112 - 1212 First Street S.E.
Calgary, Alberta
T2G 2H8
Ph. 237-6423
Sells IBM, Xerox, Digital, Apple, Atari

Lanpar Ltd.
Suite 17, 6025 - 12 Street S.E.
Calgary, Alberta
T2H 2K1
Ph. 253-8866
Sells, leases & rents Digital Equipment Corp.
and Osborne

Pussycat Business Systems Ltd.
10005 - 97a Street
Grande Prairie, Alberta
Ph. 532-4140
Sells Apple

Radio Shack Computer Centre
12310 Jasper Avenue
Edmonton, Alberta
T5N 3K5
Ph. 482-2353

Radio Shack Computer Centre
839 - Sixth Avenue S.W.
Calgary, Alberta
T2P 0V3
Ph. 266-4561

The Computer Terminal
Parkland Mall
B - 4747 - 67 Street
Red Deer, Alberta
Ph. 343-6797
Sells Apple. A dealer for Countryside Data farm
software.

TJB Microsystems Ltd.
10458 - 82 (Whyte) Avenue
Edmonton, Alberta
T6E 2A2
Ph. 433-3161
Sells Commodore

Total Computers Ltd.
929 - S Railway Street S.E.
Medicine Hat, Alberta
Ph. 529-5200

Total Computers Ltd.
#1, 2015 - 32 Avenue N.E.
Calgary, Alberta
T2E 6Z3
Ph. 250-2102
Sells Apple, Alpha Micro, Cannon,
Osborne, Televideo

Total Computers Ltd.
521 - 5th Street S.
Lethbridge, Alberta
Ph. 320-1448
Sells Apple, TI, Alpha Micro, Cannon & Osborne

Trianex Computer Systems Ltd.
203, 10115 - 150 Street
Edmonton, Alberta
T5P 1P2
Ph. 483-5999
Sells Toshiba

WestWorld Computers Ltd.
11112 - 101 Street
Edmonton, Alberta
T5G 2A2
Ph. 471-1727
Sells Apple and Xerox

WestWorld Computers Ltd.
10805 - 82 Avenue
Edmonton, Alberta
Ph. 439-3971
Sells Apple and Xerox

SOFTWARE

IST CANFARM
14815 - 119 Avenue
Edmonton, Alberta
Ph. 451-4067
Accounting & farm planning services plus IBM
software sales

Countryside Data
4013 Nipigon Road S.
Lethbridge, Alberta
T1K 4P8
Ph. 320-0782
Sells Countryside Data farm software

Creative Farm Resource Ltd.
#1 - 12415 Stony Plain Rd.
Edmonton, Alberta T5N 3W3
Ph. 482-2030
986-7420
Sells the Farmplan farm software

Farmfax
Box 428
Raymore, Saskatchewan
S0A 3J0
Ph. (306) 746-2271
Sells Radio Shack Models and the Homestead
turnkey system. Leases & sells farm software
for Radio Shacks and Apples

(No 5, June, 1981)

OTHER FARM COMPUTER NEWSLETTERS

Recent expansion and importance of on-farm microcomputers has lead other firms to enter the agriculture microcomputer newsletter market. Two recent entries into that market are listed below. To date, a sufficient amount of their farm-computer material has already been covered by this Newsletter. For more information or placement of their mailing list, you can write to:

Successful Farming
Farm Computer News
1716 Locust Street
Des Moines, Iowa
50336
Cost - \$40 US per year

Agricultural Computing
Doane Agricultural Service
8900 Manchester Road
St. Louis, Missouri, USA
63144
Cost - \$48 US per year

(No 6, July, 1981)

REVIEW OF THE OSBORNE GENERAL LEDGER (O.G.L.) ACCOUNTING PACKAGE

The O.G.L. is part of an automated computerized system for small businesses. The package is available for various microcomputers. This package was evaluated on a Commodore PET with a dual disk drive.

Operating the O.G.L. Package

Upon purchasing the program, you receive one program disk containing a practice Chart of Account File to familiarize yourself with the program. An additional disk must be used to record day to day transactions (thus two or dual disk drives are needed). After initial loading commands and password code have been entered, the menu will be displayed which controls the loading and execution of all the O.G.L. programs. The menu displays the following programs:

0. Exit Program
2. Cash Journal
4. Posting Update
6. Account File Maintenance
8. Disk Utilities

1. General Journal
3. Petty Cash Journal
5. Report Generator
7. General Information File
9. Set Printer Code

Setting Up the Chart of Account (Account File Maintenance)

The most important aspect of the O.G.L. package is setting up the chart of accounts. This is because the chart of accounts determines what your financial reports will look like. To start creating new accounts, account numbers must be assigned to each field created. You assign account numbers (six-digit numbers) in four basic categories, according to the following scheme:

Assets	10000.00 - 19999.9
Liabilities	20000.00 - 29999.9
Income	30000.00 - 39999.9
Expenses	40000.00 - 49999.9

Having assigned account numbers (maximum 300) to all accounts, you can then assign sub-account numbers to those accounts (maximum of 10 per account). In addition, you can create titles, headings and totals among the accounts (are included in the maximum of 300 accounts). Other information needed in setting up the Chart of Accounts are:

Report Type - income statement report or balance sheet report

Normal Balance - debit or credit balance

Total Level - determines in which column accounts are to be printed

Month Field - contains balances for the month, quarter, year and three prior quarters to the current quarter.

Setting up the Chart of Accounts can be very time consuming. The time spent setting up 250 accounts by this Branch are as follows:

- 1) two days preparing and coding accounts for entry into the computer;
- 2) 1 1/2 days entering accounts into the computer; and
- 3) 1/2 day debugging accounts because of human errors.

The Transaction File

The transaction file disk is required to record the accounting transactions that take place. When entering each transaction through the General Journal, Cash Journal or Petty Cash Journal, those transactions are recorded on the disk until the command is given to post those transactions (Posting Update) for accumulative totals to the program disk which has the accounts. Once posting has been made, the transactions on the transaction disk are erased so new transactions can be recorded on that disk (maximum of 500 transactions on a disk).

When transactions have been posted, an automatic printed report of the transactions is printed. If a permanent record of those transactions are to be kept (besides printed records), it is suggested that a new transaction disk be used every month or whatever desired time period.

General, Cash and Petty Cash Journal

These Journals are where disbursements or receipts can be entered. The General Journal will accept up to ten transactions at a time covering all accounts. The Cash Journal accepts only two transactions at a time for only ten cash accounts. The Petty Cash Journal accepts two transactions for only one account. Nearly all farm transactions will be entered through the General Journal.

EVALUATION

Accounting Methods

The O.G.L. Accounting Program is based upon a standard double-entry system. For every credit entry there must also be an offsetting debit entry, and visa versa. The program is designed so that the user must make both entries for every transaction in order for the records to be in balance. It is important to note that the user must understand double-entry to make correct entries.

Code System

In purchasing any software package, proper documentation is a must. In the O.G.L. package, documentation is poor. The problem with the package that the Branch worked with is that, the program was altered and the documentation did not follow suit. Thus, screen displays shown in the manual were not comparable to screen displays on the computer. This led to much confusion and trial and error runs had to be made with this accounting package before fully understanding the operation of the package.

The account code system (Chart of Accounts) is easy to understand, but considerable time must be taken in setting up an appropriate format. Additional accounts can be added or deleted when desired.

Even if the account code system is easy to understand, problems will arise in the beginning. Human error in punching the wrong code number(s) does arise every so often, and many times the error does not appear until months later. This can and does result in inconsistent reports. Thus, it is recommended that when a computerized account system is set up, the manual system should accompany the computerized system for a year.

Recording Procedures

The recording procedures for the O.G.L. package are fairly structural with room for some flexibility. There is flexibility in placing titles, headings, totals, columns, percentage ratio in income statement (not balance sheet) and desired accounts to a maximum of 300. Descriptive entries can also be made but is very limited in space. An extra line per journal entry rather than eight spaces would have been helpful.

The General Ledger does provide for recording capital purchases, depreciable assets and inventory information if desired. The package does not provide for interfarm analysis.

The program does contain built-in accuracy checks. It does tell you whether your accounts exist or do not exist, whether your balances are equal and if to continue if an error has occurred. A drawback though, in the accuracy check, is that if an error occurs on the disk, it does not tell you where in a descriptive code. Rather, it informs that disk error # ___ has occurred.

Output Report

The O.G.L. Accounting System allows the user to print various financial statements. It does not allow the user to display on the screen various financial statements for quick reference (except individual's accounts). At any time, the following statements can be printed:

- 1) Trial Income and Balance Sheet
- 2) Monthly, Quarterly and Yearly Income and Balance Sheet
- 3) Previous Quarterly Reports (up to three previous quarters)
- 4) General Journal Report
- 5) General Ledger Transaction File Report
- 6) Special Report (regular account balances); and
- 7) General Ledger Account Balances (for month, quarter, year and previous quarters)

The General Ledger Update Report (opening balance, net change and closing balance) can only be printed when the transactions are posted to the Account File.

An area of concern for a good farm accounting package is that the following reports are not and cannot be included in the O.G.L. package:

- 1) Cash flow report;
- 2) A separate crop and livestock inventory listing that would link with the General Ledger to keep and inventory update plus be able to generate a separate report;
- 3) Depreciation schedule;
- 4) A profit and loss report for each enterprise;
- 5) Summary of principal and interest payments;
- 6) Payroll summaries; and
- 7) Financial ratio report between enterprises.

A minor concern is that family living reports and accounting cannot be included in this accounting package.

The O.G.L. package does provide for the flexibility of uniformity in reports and reports can be reconciled with the cheque book balance. It also provides for accounts payable and receivable to be included in the accounting package. Automatic page numbering on the reports is helpful to keep records in order.

CONCLUSION

The Osborne General Ledger is an automated accounting system for small businesses. As such, it is not recommended for farm accounting if detail reports are desired. The accounting package does not have the flexibility to include many farm reports that are useful in making good managerial decisions.

(No. 7, August/September, 1981)

NEW COMPUTERS

The summer has brought some new developments which have great impact on anyone looking to buy a computer or even those that have their computer already.

1. There have been three new microcomputer system announced. Two use the CP/M operating system which allows access to a wealth of (sometimes very expensive) software. The first is the XEROX 820 or Simply Amazing Machine. It consists of 64k memory, a Z-80 microprocessor (the same as are used in the Radio Shack Models I-II and III), a detachable typewriter style (IBM Selectric that is) keyboard, 80 x 24 line screen, 4 interfaces (2 serial and two parallel) and dual disk drives. The size of the disk drives determines the price of the system. With dual 80k 5 1/4" disks the price is \$4,500 while dual 256k 8" disks up the cost to \$5,900. However, one must buy all of the system software. The operating system CP/M costs \$300, BASIC costs \$500, a VISICALC-like language (SUPERCALC) costs \$450. These prices put the XEROX in the TRS-80 Mod II range. At this time, it is being sold directly through Xerox or Computerland. It seems to be aimed at word processing rather than mass data storage as indicated by the size of the disk drive.

The HP-125 is the first Hewlett Packard which can use the CP/M operating system. It has Z-80 processor, 64k bytes of user memory, 2 serial ports, 1 parallel port compatible with Commodore equipment and double sided 5 1/4" or 8" floppy disks. However, the price is as high as the quality. With dual disk drives (256k bytes per drive), the price is approximately \$10,000. HP has decided to distribute the CP/M software itself and the list includes VISICALC/125, Word/125 (word processing), Graphics/125, Link/125 (a communications package) and BASIC/125 (a version or microsoft BASIC). As anyone who has used HP equipment will tell you this machine offers superior quality but does not really compete in price terms.

Finally the IBM Personal Computer. What can you say about a product that comes from the industry's largest player? The name alone is enough to strike fear into the hearts of its competitors. However, there is more than a nameplate to this machine. It starts with an Intel 8088 processor chip which is a scaled down version of a 16 bit mini-computer. This allows theoretical expansion to one million bytes of memory, although there is only room for 256k inside the IBM's box. The detachable keyboard is organized much like the IBM Selectric and is reputed to be one of the most comfortable to use. It has either an 80 x 24 line or 40 x 24 line screen depending on the quality of the monitor you are using. It has color graphics in four colors with 640 x 200 resolution. The most

interesting point is that the IBM used a disk operating system from MICROSOFT not compatible with CP/M. The disks are 5 1/4" and stores 160k per drive, about average for a machine in its price range. The price range is certainly competitive. For a 16k starter system with no monitor, the price is about \$2,150. A dual drive 48k system with B/W monitor and printer would cost approximately \$6,250, software not included. The DOS, BASIC and VISICALC would run from \$300 to \$500 per package, although these were not firm prices at this time. Computerland has exclusive marketing rights, although IBM will talk to you if you want to buy 20 or more. In conclusion, one can build a pretty powerful system from a relatively inexpensive base. IBM did not get to be the biggest from luck.

2. So far, I have spent a lot of time stressing the CP/M compatibility of these new machines. I will explain in the next issue why CP/M will become the standard microcomputer operating system of the 80's. The obvious question is: What ag-ware is available? The first and foremost is the Homestead software. In a conversation with Homestead President, Sheldon Fulton, he indicated that they are willing to sell the software alone to anyone who has a CP/M system. The only constraining factor was the disk storage available on the users computers. Farmfax's General Manager, Ed Plohr, also indicated that future development would be conducted on CP/M in addition to the Radio Shack and Apple operating systems. They are also converting many of the existing programs to CP/M.

CP/M

(No. 8 - October, 1981)

CP/M stands for Control Program/Monitor and was developed in 1973 by software consultant Gary Kildall and marketed by Digital Research. In the world of microcomputers, something that is eight years old is considered to be ancient history. Why am I writing about this package at such a late date? To answer this question, let me describe what CP/M is. It is an operating system for microcomputers with the 8080, 8085 or Z80 microprocessor chip (the TRS-80's have Z-80 chips in them). It allows the computer to use its disk drives to work. When you start a computer which uses CP/M, the computer reads in the CP/M program from the disk into main RAM memory. Usually this is done by an automatic process called bootstrapping. Once in memory, CP/M makes available seven commands of which five will be most useful. These are:

DIR	(display the directory of files on the disk)
TYPE	(display contents of disk file on screen or printer)
ERA	(erase a file from the disk)
REN	(renames a file on the disk)
X:	(will change the current default disk if you have more than one)

The filename in CP/M can be up to eight characters long (upper case only) with a three character extension. This extension defines what kind of file it is. For example, a BASIC program called HAYCRAB would look like this in the directory, HAYCRAB.BAS. The period is used to delimit between the filename and the extension. CP/M also allows the concept of wild carding which will have a command work on more than one file. For instance, to take a directory of all BASIC files type: DIR *.BAS

The * means ignore all characters in front of .BAS. There are also a set of transient commands which are not in memory until called by the user. These are actually small programs which are stored on the disk. They are:

STAT	(provides information about a file or group of files or to find remaining space on a disk). STAT can also lock files so they cannot be altered).
ED	(a very simple text editor considered by many to be almost useless).
DUMP	(lists a file on the terminal in machine code, not a very useful feature for most people).
SUBMIT	(allows one to build a file of CP/M commands which can save typing them in every time).

There is also a set of programs which allow the backup of diskettes and adjust CP/M for memory size. These are: FORMAT, COPY MOVCPM and SYSGEN.

Not all diskettes have to use CP/M; these could be data diskettes and thus have more space. What does CP/M give you? If you have a machine that has a 8080, 8085, Z-80 or 8088 microprocessor chip, you have a wider source of software available to you. CP/M is not an easy system to use. Its commands are very primitive compared to TRS DOS and others. The question of disk formats being different between brands still makes transfer difficult. However, despite its shortcoming, CP/M has been determined by the microcomputer industry as a de-facto standard. Thus the question, "does it have CP/M" will become increasingly important to ask when buying a microcomputer in the 80's.

APPLE MAGAZINES*

A well planned and edited magazine is one of the best supports a computer owner can find (look at Compu-Farm for example). Apple owners are more fortunate than some, as there are a wide variety of magazines available. Here are a few (perhaps biased) comments on some of the more prevalent ones.

NIBBLE:

Box 325, Lincoln, MA, 01773 (\$35.50/year US) Strictly for the Apple. Each issue usually contains a program each for business use, entertainment and programming. Departments include financial applications, "TIPS and Techniques" and machine language. Articles range beginner to expert. Monthly hardware/software reviews.

APPLE ORCHARD:

Internal Apple Core, P.O. Box 1493, Deaverton, Oregon, 97075, \$15. This is a user group magazine. Topics vary monthly and tend to address specific techniques, hardware, and problems. Can be quite technical. This is one of the best user group publications, others include: The Apple Peel, Apple Seed Newsletter and Apple Bits.

Call - A.P.P.L.E.:

Apple Puget Sound, Program Library Exchange, 304 Main Avenue South, Suite 300, Renton, WA, 98055 Ph. 206-271-4514. One time application fee of \$25 plus \$15/year subscription. This is a user group magazine as well, but is aimed at highly technical programming and hardware modifications.

MICRO:

34 Chelmsford Street, Box 6502, Chelmsford, MA. This is a general magazine dedicated to the 6502 CPU computers. It does have two especially desirable features such as a large Apple program/article section, hardware catalog, software catalog, and bibliography. It seems to be written for middle-of-the-road computerists who are familiar with their machines, yet are not at a high technical level.

COMPUTE:

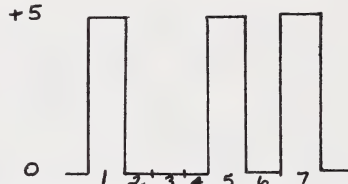
Box 5406, Greensboro, NC, \$25/year US. Like Micro, this magazine caters to 6502 based machines. Its main emphasis is Atari and Pet, but there is a small section on Apple each month as well as a general section that applies to Apples as well. This one is aimed at the beginner to intermediate group.

* Contributed by Doug Walkey, District Agriculturist, Drayton Valley, Alberta

(No. 9 - November, 1981)

RS-232 AND OTHER WONDERS

If you wish to use your micro for data communication or just want to hook up to a serial printer, RS-232 is the electrical and logical standard that you will be using. To go back to our fundamentals, serial transmission is a way of sending out data on a single wire one bit at a time. Let us say you want to send the letter E (upper case) over a wire to a printer or a modem (I'll talk about modems later on). The letter E has a binary code of 1000101 which is by the conventions of ASCII. If you were using a large IBM, the code would be different. If we were to represent 1 by a +5 volt pulse and a 0 by zero volts, A would look like this:



The vertical axis is voltage and the horizontal axis is time (let us say 1 second). If we sent out this character over a wire where each bit (1 or 0, +5 volts or 0 volts) takes one second to transmit, it would take 7 seconds to transmit the whole character. Surprise! Serial transmission is just like the old telegram system except the code is different. Let us now change our electrical standard so that a 1 is represented by a positive voltage (say +12 volts) and a 0 is represented by a negative voltage (say -12 volts). Our letter E now looks like:



How does the printer or modem tell when one character starts and ends? This is achieved by the use of start and stop bits. The character will have one start bit which is always 0 (-12 volts) appended to the front and one or two stop bits which are 1 (+12 volts) appended on the end. This gives the receiver the ability to differentiate between characters. Now that characters are separated, is there some way to check if anything has been garbled? This is done with a method known as parity. This method takes the data bits and adds them up and determines whether the result is odd or even. Once this is done, another bit is added onto the end of the character. If even parity is selected, a bit is chosen to make the sum an even number. If odd parity is selected, a bit is chosen to make the sum an odd number. If no (mark) parity is selected, no bit is added to the character. For example, our letter E has three 1 bits in it (1000101). If even parity is selected, a 1 is appended onto the character (10001011). There are now four bits an even number. However if two bits are changed and actually reversed (e.g. 10 to 01), the parity cannot detect the error. This would only happen under very noisy conditions. We can see that the transmission is very precise yet forgiving to errors. The proviso is that both sender and receiver must work by the same rules.

Let's talk about speed of transmission of the character itself. If we send a start bit, a seven bit character, a parity bit and two stop bits at a rate of one bit per second, it will take 11 seconds to transmit. This is fairly slow. The speed that most modems work at is 300 bits per second (BPS). Printers can work from 150 to 9600 BPS. One can translate bits per second (also known as BAUD) into characters per second by dividing by 10. Thus 300 BAUD is also approximately 30 characters per second. Again the sender and receiver must be working at the same speed or there will be problems.

Let us finally look at the electrical connections and how to make some sense of them. The connector is composed of 25 pins or sockets arranged in two rows; one 12 pins the other 13. The plug is in a D shape (one side shorter than the other) thus it can only be plugged in one way. There are two types of equipment which are defined by the standard, Data Terminal Equipment (DTE) and Data Communications Equipment (DCE). The DTE is something like a Terminal, Printer or the RS-232 port of most micros. The DCE is usually a modem. The basic pin arrangement is:

SIGNAL	PINS ON DTE	PINS ON DCE
ground	1,7	1,7
received data	3	2
transmitted data	2	3
request to send (must be a positive voltage or the DCE will not send)	4 output	4 input
clear to send (plus voltage sent by DCE, DTE needs this to send)	5 input	5 output
data set ready (DCE sends plus voltage, DTE detects)	6 input	6 output
Date Terminal Ready (DTE sends plus voltage) when ready DCE reads Carrier Detect (DCE sends when a phone connection is made.	20 output 8 input	20 input 8 output

One can wire the pins straight through (pin 2-pin 2, etc.) if there is a DTE on one end and a DCE on the other. However, if you want to connect two computers together e.g. a Radio Shack to an Apple, you have the situation of two DTE's trying to talk on the wire at once. They both use the same frequency and their signals block each other. If we hook up pin 3 on a DTE to another DTE's pin 3, they are both waiting for received data which never comes. One has to cross the wires so that pin 2 goes with pin 3, they are both waiting for received data which never comes. One has to cross the wires so that pin 2 goes with pin 3, pin 4 goes to pin 5 and pin 6 to pin 20. Also the computer may require that pin 8 (carrier detect) be positive. These can be wired to +5 or +12. I have given you a taste of the possibilities of hooking up serial printers, modems and computers to each other. If one understands the signals, you can connect equipment of different manufacturers with custom made cables you make yourself for a fraction of the cost. A good reference for interfacing equipment is Microprocessor Interfacing Techniques by Austin Lesea and Rodney Zaks, SYBEX, Berkeley, CA. **A NOTE OF CAUTION:** Make sure the equipment is RS-232 compatible! Old teletypes use a system called current loop which can actually do serious damage if hooked up to RS-232 equipment.

(No. 10 - December, 1981)

NEW AGRICULTURAL SOFTWARE

Here is a copy of a promotional brochure received from Dawson, Dau and Associates Ltd.:

FEEDLOT MANAGEMENT PROGRAM NOW AVAILABLE

Dawson, Dau and Associates Ltd. is pleased to announce the availability of our Feedlot Management Program. This software is designed to automate physical record keeping for the day-to-day operations necessary to run small to moderately large (about 5000 head) cattle feeding enterprises.

General Description

The modules incorporated into our menu driven software are initialization, client manager, lot manager, pen manager, feed manager, ration manager, billing and profit/loss subsystem. Before animals can enter the feedlot, support resources (number of pens; maximum number of animals allowed in individual pens; types, quantities and value of feed ingredients; ration composition; names and addresses of feedlot clients) must first be defined. Once this has been done, animals can be assigned unique ear tags or brand identifications, grouped into lots linked to owners from the client list, and routed to the appropriate pen(s).

After animals have entered a pen they may be fed (by pen, in smaller groups, or singly), moved around from pen to pen and accumulate vet, yardage and other non-feed charges. Progress of the animals can be tracked by means of reports generated either at the lot or pen level. At the end of each month a billing report may be produced showing animal status and charges for the month as well as summary information cumulated from the beginning of the feeding period. If desired, interim profit/loss statements can also be printed. When the animals leave the feedlot a final profit/loss statement is provided for the client. Summary information about the closed out animals is retained until the rest of the animals in the lot are sent to market.

Program Physical Limits:

- up to 255 clients
- up to 255 lots
- up to 126 pens
- up to 255 animals per pen
- up to 15 separate rations
- up to 26 ration ingredients
- up to 4,095 animals within a given ear tag or brand group

Minimum Computer Configuration Required:

- 1 Apple II or Apple II+ microcomputer with the 48k memory and Language System options
- 2 diskette drives
- a video monitor or standard T.V. set with an R.F. adaptor
- any serial or parallel printer capable of displaying 80 columns of output

Further Information:

If you require additional information about our package, please feel free to write or phone:

Doug Dau, Dawson, Dau and Associates, 402 Mayfair Place, 6707 Elbow Drive S.W., Calgary, Alberta, T2V 0E4, Phone: 284-6538 or 252-5575.

No. 11 - January, 1982

CASH AND ACCRUAL ACCOUNTING - by Ronald H. Cuthbert, Farm Business Management Branch

Many Compu-Farm readers already have a bookkeeping system for their farm and are currently looking at computerized systems or are starting from scratch to develop a system. To assist you in this search, it may be of help to retrace our steps and consider some definitions and examine the principles of bookkeeping so you can apply these to your search through computerized systems.

Methods Defined

Under the cash basis of accounting revenues from the sale of goods are entered in the records in the time period when cash is received from the sale. The time period is the "accounting time period" fiscal year; this may be simply the calendar year. Expenses are usually reported in the books in the time period in which the payments are actually made for the purchase. Under the accrual basis of accounting revenue from the sale of produce is entered in the books when some critical event occurs that is related to the flow of earnings, usually this event is the finalized sale or delivery of the produce and is not necessarily tied to the receiving of cash payment.

The rules for accounting are based on a few underlying principles. The basic tenet on which the accrual system rests is the "matching principle". Revenue is recorded in the year it is realized (production is sold) and an attempt is made to match the expenses with the revenue. The expenses then are the costs to the farm that can be tied to the production and sale for that year. Depreciation for each year is just a way to help us match the costs of machinery and other long lived assets and the revenue for the year. Depreciation for each year is a measure of the amount of the asset that has been used up (converted to an expense for that time period) in the process of farm production for which we have recorded revenues. Expenses that can not be tied to individual production items are treated as expenses for the year; an example in this case would be shop tools.

The modified cash basis of accounting is that used by the vast majority of farmers for tax reporting purposes. Revenues and expenses are recognized (recorded) when cash changes hands as under the cash system above. However, rather than treat the full purchase price of machinery, equipment, buildings and land as an immediate expense, these items are depreciated over the useful life of the machine, building, etc. as would be done under the accrual method.

Benefits & Criticisms

Farmers, lawyers, accountants and other professionals generally use the modified cash system for tax reporting purpose. You may not convert from the cash to the accrual method unless permission to change is obtained from Revenue Canada. However, you may elect to convert from the accrual to the cash method by filing a cash return.

The modified cash system is more convenient for tax filing. Accounts payable and receivable can be ignored as may inventory valuation. Income can be adjusted to year end through various tax management strategies. These include increasing expenses for the year by prepurchasing farm inputs (chemicals, fertilizers, etc.) and at the same time postponing revenue by withholding sale of merchandise. The accrual system provides a more realistic and complete picture of the financial performance of the business. In measuring performance the cash basis of accounting suffers from two major criticisms.

First, the costs (expenses recorded) of the efforts required by you in production is not necessarily matched to these revenues. Performance between years gets confused. As a small illustration look at the cost of an annual rental fee. The sum paid in one particular month, say November, will be taken as an expense for that month. Under the accrual system a portion of that expense would be taken into each month's expense (into the following year) covered by the rental premium. The longer the time that items paid for now will benefit future years, the more serious is the criticism.

Second, the cash basis of accounting tends to postpone unnecessarily the time when revenue is recognized. In most cases the contracted sale of the goods is sufficient cause to recognize revenue instead of a cash receipt. This is less serious although for analysis purposes it is desirable to know the production that actually took place on the farm for the current year and the expenses that accompanied (matched) this production. In this way the costs of production can be carefully analyzed in the light of the quality and quantity of product forthcoming.

Farmers generally find benefits from reporting taxable income on a modified cash basis and analyzing business performance by converting this cash statement to an accrual accounting form. How does this relate to the program you may choose? Most computerized accounting systems are of the double entry accrual form. These systems are, as discussed above, excellent for business analysis purposes but must be adapted by the user for income tax filing. Also many computerized systems contain subsystems for general ledger, accounts payable and accounts receivable, payroll, inventory control, and fixed asset records. Some contain management accounting packages, such as job cost systems.

It is necessary to choose the systems you require depending on circumstances. If you do employ farm labor, a payroll package can be very helpful provided tax, U.I.C. and C.P.P. are updated regularly to the Canadian situation. Often not all packages available will be required on your farm.

Finally, many general ledger packages are based on the retail model and are most suitable to businesses such as corner stores that purchase and retail their merchandise. A general ledger system based on the manufacturing format may be closer to the actual production system of your farm. Producing financial statements which take account of the process of converting raw materials to finished products is more complex but may yield more information for analysis. Also specifics such as job cost systems for feedlots or swine enterprises might be considered along with other available management accounting systems.

BEST OF VOLUME 3

(Vol. II, No. 12 & Vol. III, No.1)

EQUATION CORNER

This is a new feature that will be aimed at farm management applications. Many times the programming is easier than finding the formula (or algorithm) that applies to the situation. This is particularly important to VISICALC users who just want to put together a quick model but have to dig to find the equation. Our first set of formulae deal with the value of money over time. (Simple you say? Try to find them all on one page!) First the variables:

P = the present value of a lump sum of money
 S_n = the future value of a lump sum of money
i = the annual interest rate expressed as a decimal e.g. 10% = .1
n = number of years to be analyzed
 A = amount of annuity that is an annual payment
 Now the formulae in mathematical and BASIC form.

1. Present value of a future lump sum e.g. how much will \$100,000 in 1992 dollars be worth today at a 10% inflation rate?

$$P = \frac{S_n}{(1 + i)^n}$$

2. Future value of a present lump sum e.g. how much will you have to earn in 1992 to equal the purchasing power of \$20,000 today?

$$S_n = P (1 + i)^n$$

The next group of formulae deal with series of equal payments made at regular intervals of time. Where the payment is made at the end of a year, the annuity is called an ordinary annuity.

3. Present value of an annuity e.g. if one were to put \$1,000 in the bank for 10 years at 10%, what would be the equivalent lump sum that would have to be deposited this year to equal the stream of deposits?

$$P = \frac{A (1 - (1 + i)^{-n})}{i}$$

4. Future amount of an annuity e.g. you wish to set up a fund for a college education for your children. If you deposit 1000 per year at 10% per year, what would the fund be worth in 10 years?

$$S_n = \frac{A((1 + i)^n - 1)}{i}$$

5. Sinking fund e.g. you wish to have a fund of \$50,000 in 10 years to make some kind of purchase. How much money would have to be deposited every year at 10% interest?

$$A = \frac{S_n \times i}{(1 + i)^n - 1}$$

6. Amortized value e.g. given a lump sum of 10,000 that could be deposited this year at 10%, what yearly amount would be required to be deposited to equal the future value of that lump sum after ten years?

$$A = \frac{P}{\frac{1 - (1 + i)^{-n}}{i}}$$

This month we will look at the formulae which allow you to calculate periodic payments on a loan. Because loans can have different payment periods and compounding periods, we in Canada must find the EFFECTIVE interest rate before we can calculate the periodic payment.

if e = effective interest rate
 i = nominal interest rate (that stated on the contract)
 k = number of payments per year
 m = number of compoundings per year

$$e = k * \left(\left(1 + \frac{i}{m} \right)^{\frac{m}{k}} - 1 \right)$$

or in BASIC form with e & i expressed as decimals

$$e = k * ((1 + i/m)^{(m/k)} - 1)$$

if P = principal to be repayed
 N = term in years
 then the periodic payment pa is:

$$pa = \frac{P * \frac{e}{k} * \left(1 + \frac{e}{k} \right)^{Nk}}{\left(1 + \frac{e}{k} \right)^{Nk} - 1}$$

in BASIC form pa is:

$$pa = (P * e / k * (1 + e/k)^{(N*k)}) / ((1 + e/k)^{(N*k)} - 1)$$

Remember: if you are translating these statements into VISICALC, that language evaluates expressions in strict left to right order ignoring any mathematical heirarchy. Thus $(1 + e/k)$ must be written as $(e/k + 1)$ to work properly.

REVIEW OF THE IBM PERSONAL COMPUTER

When I first got into microcomputers, I always dreamed of owning an IBM. Some monstrous machine with whirring tape drives and a big console with flashing lights. Instead, I now own an IBM with whirring floppy disk drives and the only lights are the busy lights on each disk drive. But it is still an IBM, which connotes "computer" to anyone in North America. Now that I own one, I would like to give you a quick review of the hardware and some of the software.

I purchased the unit from Computerland in Calgary for approximately \$4,900. It included 48k of RAM, dual 160k disk drives, a RS-232 card and a games interface card. The IBM is put together in a modular fashion. If you want color display, you must buy a color display card. If you want extra memory up to 256k, you must buy memory cards. The trick is buying the right options for your needs.

The color display board has three modes of operation, text (either 40 or 80 columns), medium resolution four color graphics (320 x 200) and high resolution black and white graphics (640 x 200). However, if you don't need the graphics, you can buy a monochrome display card. This hooks up to the very high quality (\$500) IBM green/black CRT monitor. One gets an added bonus with this card, a centronics style printer port. If you buy a color display card and want to run a printer, you must buy a printer card separately. The total cost is \$150 more than the monochrome printer card. Sound complicated? Believe me, it is. I guess this is where a good dealer comes in handy. The Personal Computer (P.C. for short) comes in a squat grey and cream box which houses dual disk drives and the internal electronics. It also has a fan in the power supply which draws cool air over the densely packed circuit board. I found the fan to be rather noisy in a quiet room but I would trade noise for fried components any day. The most impressive external feature is the detached keyboard. It has a full typewriter layout (the keys click) with a numeric pad (which doubles as a cursor control pad) and 10 special function keys along the left side. These keys are used to bring up common BASIC commands such as LIST, RUN, LOAD, etc. They can also be redefined by a BASIC program for things like menus (to go on press key 1, to stop press key 2). The disks are not as large as I had hoped (160 k) but they are adequate for applications not requiring massive data storage.

The IBM is available with three disk operating systems and three versions of BASIC. The operating systems are IBM-DOS, CP/M-86 and PASCAL. IBM DOS is very inexpensive at \$50 and provides two versions of Microsoft BASIC. CP/M-86 and PASCAL are much more expensive and are not yet available. BASIC comes in a cassette version which is in the read only memories and is used without disks. Disk BASIC adds disk handling commands while Advanced BASIC adds graphics and music commands. Make no mistake, cassette BASIC isn't a stripped down version. The ease of programming in BASIC is enhanced by the excellent screen editor that is provided. If you want to change anything, you just move your cursor up to the offending line on the screen and correct it. If you want to insert into a line, hit the insert key and start typing. Everything in the line will be moved over to the right from the point of insertion. Compared to the clumsy line editing of Radio Shacks, the IBM is a time saver. The manual for BASIC is very concise yet easy to follow as are all the manuals for the IBM.

I have used both VISICALC and the EASYWRITER word processing package. VISICALC is the more advanced version now available for APPLE's and TRS-80 Mod III's. With 64k of memory, one has 35k free to construct models. However, the model workspace is restricted to 64k even though you may have expanded the IBM to 256k. A new release of VISICALC should solve this problem. EASYWRITER is the first word processing package to be made available for the IBM. It has been nicknamed not-so-easywriter with some justification. I found it slow and difficult to use. It has one advantage, low cost (approximately \$200) but should only be used for low volume applications.

To sum up, the IBM is a cut above the older machines on the market in dollar value. It will no doubt be a very popular machine. My beefs were few.

1. It only has five expansion slots of which two are occupied by the display and disk controller cards. There need to be more multi-function cards like memory + RS-232.
2. As a modular machine, every card that plugs in must be carefully selected. Computerland has aided this process by selling packages which include the necessary cards.
3. Everything at this point seems to be limited to 64k workspaces e.g. VISICALC and BASIC. Any memory past 128k is wasted until new software comes out.
4. There is very little software available. This cannot be a beef since the machine has only been available in bulk since January. When it becomes popular, there will be a flood of software, but buyers should still follow the adage of "buy for software first". It might even be best to hold off buying decisions for six months to see what IBM's competitors do.

(No. 2 - April, 1982)

7TH WEST COAST COMPUTER FAIR

Back in March, I attended the 7TH WEST COAST COMPUTER FAIR in San Francisco. This fair had about 400-500 exhibitors and was attended by over 40,000 people in the three days it was on. This was the first time I had attended such a large function. I really needed the full three days to see it all. Although this show is rarely used to introduce new products from the major manufacturers, the software vendors formed the primary attraction for the attendees.

There were some very important trends that emerged at the show:

First, IBM will become a very major force in the market. This was evidenced by the number of software houses that are going full tilt towards conversion of existing products to the IBM. If availability of software determines success in the marketplace, the IBM will be successful indeed.

The Japanese invasion was very much in evidence with models from such well known names as Sharp, Mitsubishi, Sanyo, Hitachi and Nippon Electric (NEC). These machines all had similar features which included high resolution color graphics, 80 columns screens, lots of keys on their keyboards and usually 64k of RAM. Their prices were comparable with North American models. Those who expect prices to drop drastically downward because of Japanese entry into market will be disappointed.

There was another battle going on between the manufacturers of briefcase sized computers. These included Osborne (which price at \$4,000 U.S.) and Panasonic (actually a programmable calculator with a Munchkin sized keyboard). They are aimed at the mobile executive type, although these are the ideal machines for producers who want to pool their resources and buy one with appropriate software. That is, the computer can come to you, not the other way around.

Of the software houses (which were the most common exhibitors), the game producers had the best looking and expensive displays. This indicates that no matter how useful and efficient we may claim our computers to be, games are still the major use for most popular microcomputers. Come on people, let's just accept that fact and stop feeling guilty about it.

One final note about the software houses, some of these are actually book publishers such as McGraw-Hill, Wiley, Sam's and others. I think in the future, you will be able to buy software from the bookstore as well as a computer store. When software hits the big time, the prices should go down as the volume goes up (I think there could be Coles Software, an exciting thought).

FARMPLAN SOFTWARE FOR THE APPLE II

After the show was over, I visited the offices of FARMPLAN COMPUTER SYSTEMS INC. in Sunnyvale, the heart of California's Silicon Valley. They have been in the ag software business since January of last year. The company is composed of 13 people headed by Suzi Allen formerly of Eurapple (the European marketing arm of Apple) and Milo Tenny, who is an agricultural economist. While in Europe, Ms. Allen acquired the marketing rights to the original FARMPLAN programs which originated from a group of dairy producers in the U.K. However, the North American programs are considerably different from the originals. They have several packages which include:

1. FINANCIAL PACKAGE (U.S. \$1,200) This is a full double entry system that includes enterprise accounts, accounts receivable /payable and a full audit trail of account activity. It assumes transactions in terms of DEBITS and CREDITS. The reports give the standard reports like trial balance, income statements and balance sheet. The income statement can be on a whole farm or enterprise basis. I operated the program without having to look in the manual; it was completely menu driven. My only complaint was the lack of terms that would make the package friendly to a non-bookkeeper i.e. the reference to debits, credits and departments. Why not decreases, increases and enterprises? This package shows something I have come across many times, stay away from double entry accounting software if you don't know anything about double entry.

2. CROP MANAGEMENT (U.S. \$950) This package allows the user to track the status of his fields and their respective crops on a historical basis. Each field is given basic data such as rotation, description, gross and net acres (or hectares, the program doesn't care). Soil analysis can also be entered into the field record. The user then inputs his own set of

codes to describe crops and resources that are used in growing these crops. One can then enter the resources needed for up to five cropping programs (called an application program) this includes field work, herbicides, fertilizers, etc. Each resource is applied on a certain date with a certain quantity and value. This can then give the total cost of growing the crop both on a proposed and actual basis. As each resource is applied, the inventories of that resource are updated and can be requested at any time. In terms of absolute numbers, the package can record 150 fields, 200 resources and 48 applications per program and the number of programs is restricted by disk space. The package gives very good cost of production estimates as well as a way of tracking costs. It does not provide for tracking of inventories of harvested crops. It does not at this time tie into the Financial Package so things like fertilizer purchases must be entered twice.

3. DAIRY HERD MANAGEMENT (U.S. \$950) This package allows the user to track the production and breeding performance of up to 600 cows. The information stored on each cow includes cow # (used to retrieve the individual data), date due, group #, lactation #, times bred, pregnant/open, days pregnant, days in milk, days not bred, lbs milk, % bf, milk to date, 305 day milk and % change from last test date. The reporting section allows the user to design his own reports which could include any of the above information for selected groups of cows. The reports will also calculate averages and totals. Individual records for selected cows can be printed which include information on the previous four lactations. There are also printed action lists which provide these reports: 1 - cows due for calve, 2 - cows last bred 18-22 days ago, 3 - open cows, 4 - cows due for pregnancy check, 5 - cows due to dry off, 6 - cows due for lead feeding. The package, like the others, was easy to use.

4. PIG PACKAGE (U.S. \$950) This is a program which can keep the records for 60 boars and 600 sows at 10 litters per sow. The user enters basic control information on the herd which includes: suckling period, small litter warning, week for preg check and others. He then sets targets for things like average born alive, sows bred/week, averaged weaned/litter, and about 21 others. Data is entered on a weekly basis with each sow or gilt given a numeric code that is used to refer to that animal. Other weekly occurrences such as new animals, sows bred, checked, farrowed, culled, and deaths are entered in. Feed activities are also entered. Up to seven reports are then printed. These include herd report, weekly summary, litter profile, statistics (rolling averages at 4, 26 and 52 week periods compared with the target information) boar report, farrowing due, and performance lists. Up to five weekly action lists can also be produced. These are sows not bred, sows to watch for heat, due for preg check, due to farrow, and due for weaning. Also all females can be listed by status from gilts to sows weaned/not bred. This program is extremely detailed but still easy to use. One rub, expect to go for lunch while the full set of reports is printed. Thank goodness this only happens once a week.

5. LEAST COST RATION CALCULATOR (U.S. \$550) This program can calculate a least cost ration from up to 30 feeds on 30 requirements. The example program I ran had 8 feeds and 10 requirements solved in 4.5 minutes.

6. OTHER PROGRAMS- They had a file manager called FARMFILER which sells for U.S. \$225. This package is supplied with several predefined files like cattle records, calf records, sheep records and others. For users of VISICALC, they have a set of predefined models called FARMCALC (U.S. \$125). These include farm budget, cashflow, labor profile and others. They also have FINANCIAL UTILITIES (U.S. \$225) which calculates depreciation, interest, loan payments and also does linear regression.

Most of the above programs run on a 48k Apple II+ with dual disk drives and an 80 column printer (132 col recommended). Most of the FARMCALC models require a 64k Apple II while the FINANCIAL UTILITIES only require one disk drive.

My first impression of this group was that they are very professional and particularly oriented towards customer service. They are definitely a group to watch. For further information on their packages contact them directly at 1055 Sunnyvale-Saratoga Road, Sunnyvale, California 94087, phone (408) 746-0636 or Darrell Hein, R.R. #2, Leduc, Alberta (408) 986-2382.

(No. 4 - June, 1982)

IST CANFARM RELEASES SOFTWARE FOR THE IBM PERSONAL COMPUTER

IST Canfarm Inc., the new company who privatized the Canfarm program, is launching a microcomputer option which will allow farmers and their accountants to punch in financial data, correct transactions, print an audit trail report, and batch-in data to a mainframe computer in Montreal, Quebec. This new development will make financial information more accessible for over 500 farmers and 60 accounting firms using the Canfarm financial management program in Alberta. "Farmers can expect to receive their information much sooner if their accountant is inputting their data locally. This will cut down on turnaround time, and virtually eliminate errors in the reports" said Sam Fialkow, Marketing Manager of IST Canfarm Inc. in Alberta.

TRYING OUT AN OSBORNE

This month's CompuFarm was typed on a OSBORNE I computer which is somewhat appropriate since I am reviewing this machine. I rented an OSBORNE from the good offices of Allen Mclellan, the District Sales Manager of LANPAR, for one month of torture testing. LANPAR is the largest rental and sales agency for terminals in Canada with a legendary service and support force. The recent decision to carry the OSBORNE line along with their more conventional DEC terminals was most intriguing to me. It is the most inexpensive (\$2600) and portable (24 lbs) full feature micro on the market today. My first reaction to the OSBORNE was how can this machine be any good for that low price? After trying out the machine for three weeks, I can say that it is good value, has few engineering compromises, and is quite reliable.

Let's go over the details on price and physical features. It costs \$2600 (some dealers may sell for less or more, by \$100). It includes the CP/M operating system (which allows the basic operation of the machine - see the October, 1981 issue), two versions of BASIC (Microsoft BASIC and CBASIC - both very common languages), SUPERCALC (the CP/M version of VISICALC), and WORDSTAR (recognized as the most powerful microcomputer word processor). The unit is the size and shape of a portable sewing machine. There is a leather carrying handle on the top and an indentation where the power cord is stored. The indentation is covered with a plastic plate which secures to the body with velcro strips. I find that the cord which is a little on the short side, is awfully hard to stuff into the indentation. The plate also tends to pop off when the cord is not stowed just right. The bottom of the case is the keyboard which is secured with two plastic latches. To get the unit ready for use, you tip the unit on its side and unlatch the keyboard. This reveals the rest of the unit which you can prop up on the keyboard for optimum screen viewing angle. The plastic latches have plastic hinges which I think will break in cold weather - so beware. The guts of the machine has a 5" diagonal screen with a 5.25" disk drive on either side. Under each disk drive is a pocket which can store up to 12 disks. Under the pockets are electrical connections for printers, modems, external screens, and battery packs. A cable loops into the keyboard from under the

screen and must be carefully folded to keep it from getting in the way. There are also screen brightness and contrast knobs located under the screen. There are three ventilation vents, two under the pockets and one over the screen. These are the only places that air can circulate - there is no fan to cool things off. The small screen is the most noticeable feature. People have asked me how I can read such a small screen? The characters are small but clear, and if you work from a distance of one foot or so from the screen, there is no immediate eye-strain. I found that I could work with the screen for about three hours at a stretch before eye-strain set in. This, of course, would differ between people. The screen has some interesting features such as half and full intensity video and a line length of 128 characters. However, the screen only shows 52 characters on a line but by pressing the control key and cursor left, the screen scrolls horizontally. One can also scroll the screen vertically because there are 32 lines but the screen shows only 24 (you can make a very strange scrolling display by scrolling both horizontally and diagonally). I would recommend a larger screen for anyone who will use the machine on a steady basis (about \$250 for the external monitor and \$95 for the adaptor to go to the monitor).

(No. 5 - July, 1982)

TRYING OUT AN OSBORNE (continued)

Disk capacity is small by today's standards, only 92k per drive. I think there is a good reason for this. The more information there is on a disk, the more precise the drive mechanism has to be. Constant jiggling from mobile operation would soon knock more precise drives out of alignment. The moral here is not to use an OSBORNE for massive data storage, although there have been rumors about 200k drives in the future. They are quiet and fast, no other complaints here.

The keyboard has the standard typewriter layout with separate cursor control keys next to the return key. There is a caps lock key plus a control key (used often in WORDSTAR for special functions), a tab key, and an escape key (often used to send codes to a printer). There is also a backslash key and square brackets. A numeric pad with its own return key is to the right of the main keyboard. The feel of the keys was positive and firm. Although there are no separate special function keys provided (like on the IBM), one can define the number keys to be special function keys when one holds down control and the number key. For instance one could hold the commonly used BASIC keyword LIST in key 1, so if you press control "1", LIST appears on the screen. Each disk can be set up differently to have different special functions for BASIC and the WORDSTAR package. This is done with a special program called SETUP which also allows one to define what kind of printer you will use (serial, parallel or PET style) and other functions like logical screen size (from 32-128 characters).

The lack of a fan was particularly telling if the machine was kept on all day. The disks got quite hot and would certainly tend to make me nervous about leaving them in. However, the machine never crashed or gave any indications of faulty operation from this torture test. The hardware side of the OSBORNE has very few faults, most of them stem from the need to make it portable or light weight. Its styling has been compared to a military field radio or the cockpit of DC-3, but like the field radio or the DC-3, utility has replaced styling as the prime engineering concerns (let's not forget cost either).

Without the added software, the OSBORNE would be just one of the pack, but with the software included as standard equipment, it becomes an outstanding value. Let's look at the BASIC languages first. The Microsoft BASIC is version 5, which is one of the most powerful and latest versions. However, one of the problems with the OSBORNE is that it only has 64k of memory and after you load in BASIC you only have about 29.5k left to put your programs in. However the BASIC has provisions to connect several pieces of the same program from the disk. This provision is called chaining. One can also merge two or more programs together while the new program can use the same data, (called overlaying). With these possibilities, the lack of memory space can be overcome. If you want the BASIC programs to run faster and to take up less space in memory, CBASIC is for you. The development process takes longer since you must create the program using WORDSTAR (Microsoft BASIC has its own editor) and run it through CBASIC, if any problems occur then you must repeat the process, no editing on the go like MBASIC. Programs written in MBASIC are not language compatible with CBASIC and must be converted. However, many commercially available programs use CBASIC as their base.

SUPERCALC is very much like the new versions of VISICALC with the ability to edit formulas and logical capabilities (IF something THEN something else). The screen looks much like a VISICALC screen except the status line is on the bottom of the screen rather than at the top. There are some important differences between the two. One can have columns of different width in SUPERCALC, which is very nice for long labels along the side of a worksheet. In VISICALC somebody could move the cursor to a nice complicated formula and type in something that would destroy the formula. SUPERCALC allows you to protect cells with formulas in them so that they cannot be altered, only the result shows on the screen. A unique feature of printing a model SUPERCALC is: if you specify a print zone that is wider than the paper width on the printer, the program will automatically print the model out in sections so you can paste it together later. VISICALC makes you do this function manually, e.g. only specifying as much as will fit on a sheet. The space available for models is 27k and a SUPERCALC model takes up less memory than its VISICALC counterpart.

The last software package provided was WORDSTAR. I have used several microcomputer word processing packages, but WORDSTAR is the most complex and powerful with 100+ special commands available. These commands allow the user to move the cursor any place in a file, delete or find and replace words or phrases, merge boilerplate (standard phrases) from the disk and control printer functions like subscripts and boldface. About the only thing it does not do is the ability to produce multi column formatted output like on a newspaper or magazine.

The screen scrolls horizontally as you type along (only 52 columns). This was a key factor in giving me a feeling of motion sickness. You can try this out by trying to read this newsletter while moving the page back and forth. Again the lack of a wider screen (at least 80 characters) can be annoying.

Let's sum up my impressions of this machine. It represents the best value for the money of any micro on the market. It has few problems when you consider the cost and portability criteria. The disk space and small screen problem, are due to be addressed in later (higher cost) versions. Although agricultural software is not yet available, I can't see why some of the less memory and disk space demanding software couldn't be adapted to this machine (are you listening FARMFAX??). The OSBORNE is aimed at the professional user who wants to take his computer along with him to the office, home or on the road (it fits under an airline seat). For more permanent locations, the advantages of portability would not be so

important. Until more ag. software becomes available, this machine remains, like the IBM, one to watch closely, but not one to rush out and buy without any software (like any other machine). You can see the OSBORNE at LANPAR offices in either Calgary or Edmonton. It is also available from Computerland in Calgary and Edmonton and L.A. Varah's in Calgary.

(No. 6 - August, 1982)

FARMPLAN DISTRIBUTOR IN ALBERTA

Here is a news release that I received recently from Darrell Hein, a dairy producer from Leduc:

NEWS RELEASE

Creative Farm Resources Ltd., of Edmonton, Alberta, is pleased to announce the farm computer programs produced by FARMPLAN COMPUTERS SYSTEMS INC. will be made available to farmers in Western Canada effective immediately. With the launching this month of the new Alberta company, President Darrell Hein suggests the gap between computer technology and the farm will be significantly narrowed. The farm computer programs represent a comprehensive approach to aid farm management functions.

After more than a decade of personal involvement with computers, Hein feels the time has arrived when farmers without a great deal of computer knowledge can now exploit the advantages of on-farm computers. Programs of FARMPLAN have been specifically designed for and tested by farmers with little or no computer background. The training and support that Creative Farm Resources provides its clients, means that the use of on-farm computers as a management tool can be a reality for all farmers.

Hein is establishing an agent network which will allow local sales and support in the major agricultural areas. Any interested parties are invited to contact him directly.

For information on the computer systems contact: Creative Farm Resources Ltd., #1 - 12415 Stony Plain Rd., Edmonton, Alberta, T5N 3N3. Phone number (403) 482-2030 or 986-7420.

GRAIN-FARM MANAGEMENT SOFTWARE

As I indicated in my last newsletter, there is a company in Saskatchewan that intends to write grain-farm management software. It is important to state at the outset that this software is not yet coded but that the initial design work has been started. The company intends to work with an initial sample of about 10 farmers who would be willing to work with the fine tuning of the system. The software will run on the series 8000 Commodore CBM equipment. This would be the 8032 or SP9000 (Super-Pet) main computer and the 8050 dual disk drive. They will have 6 programs in the series: these are Crop projection, Land management, Commodity inventory, Assets management, Loan management, and the Accounting system. The crop projection system would have the user input data concerning the cost of fertilizer, fuel, seed, and all other costs involved with a certain crop. The program then produces a crop budget that would show the most profitable combination. This seems like the standard crop budget generator that many of the extension services have produced. If the system ties with the record keeping programs, the combination would have more utility than a stand alone program. Land management seems to have some record keeping functions which would allow to keep data on the types of crops grown, the inputs to, and return from each field. This seems to resemble the concept of the Farmplan and Homestead systems.

The important data that can be derived from such a system will be cost of production figures broken down by field or crop, and data to predict potential yields given environmental conditions. On this latter point, it is probably too much to expect the program to actually predict yields, but the data could be available for future programs. The Commodity inventory system would keep track of all grain put into bins, where it came from and where it went. The system should be able to break down the grain by owner for operations where there are relatives contributing grain to the total inventory. Assets management will allow the farmer to enter the relevant data on assets, such as CCA, repairs, current value. The ability to sort and retrieve by kind of repair, CCA class would be a welcome addition. The Loan management system seems to be a standard loan calculator which can also keep track of repayment schedules. Finally, the Accounting system which will be the cornerstone of the total system, is to be of the single entry variety. The account numbers will resemble those of the income tax form. It is hoped that the program will store all of the year's transactions to allow the retrieval of transactions on any account sorted by date. Tax calculations would also be nice, even very simple ones. Although some of the individual programs are available on several other systems such as Farmfax, Farmplan, Homestead and others, the total package, (if it fits together so that data can be transferred between programs) running on a machine as hungry for software as the Commodore, could be a useful addition to the market. Those users with Commodore equipment may be interested in contacting the company for further information. Their address is: BASIC BUSINESS SYSTEMS LTD.

224 - 1055 Park Street
Regina, Saskatchewan
S4N 5H4
(306) 359-1021

Remember that this is a proposed system, so comments and suggestions received early have a good chance of being acted on.

TWO NEWSLETTERS FOR VISICALC USERS

We have recently received two very useful newsletters that contain useful hints and tips for VISICALC users. One newsletter SATN (Software Arts Technical Notes) is a house publication from the people who developed VISICALC. The newsletter is published every two months and usually runs about a dozen pages. As a house publication any announcements of new products and enhancements are more timely and accurate but this may take away from space devoted to 'hard-core' usage articles. They also cover the related software and supporting books that are currently on the market. In each issue they usually have a fairly detailed analysis of one application such as depreciation tables, financial formulae, statistical calculations etc. In many issues they look at one function or command in more detail such as @LOOKUP, @IF, @MAX and others. In summary, they tend to concentrate on in-depth analysis and on lists of supporting materials. SpreadSheet is the other publication from the International Electronic Spreadsheet User's Group. This

newsletter oriented itself towards VISICALC but has now changed its focus towards all spreadsheet programs. It has short articles on specific applications such as linear regression and has several small "Visi-tips" in each issue. An example of a Visi-tip is a way to print the row and column designators of a VISICALC worksheet. It also has reviews and comparisons of the various competitors of VISICALC (eg. SUPERCALC). Like SATN, SpreadSheet has information on supporting products and books for the spreadsheet programs. In conclusion, SATN is a good newsletter for in-depth and in-house information on VISICALC alone, while SpreadSheet covers more topics and programs. Unlike a lot of computer magazines, there is very little duplication between the two newsletters, so subscribe to both if you are a VISICALC fan and can afford the prices.

SATN
P.O. Box 494
Cambridge, Massachusetts
USA 02139
outside U.S. - 6 issues U.S. \$50.00
back issues \$6.00 + \$2.50 P&H

SpreadSheet
P.O. Box 254
Scarsdale, New York
USA 10583
5 issues U.S. \$25.00
back issues U.S. \$2.50 for current subscribers

(No. 7 - September, 1982)

AGRI-SWINE MANAGEMENT

AGRI-SWINE MANAGEMENT is a computerized sow record keeping system designed to provide ACCURATE and TIMELY production and management information in EASY-TO-USE reports. This system features the OHIO STATE SOW PRODUCTIVITY AND SELECTION CRITERIA for improving the herd. This system will increase PROFITS through better SCHEDULING of physical resources and through the utilization of the valuable sow and boar production summaries.

REPORT

The producer is able to select from a variety of reports including:

Open sow report - which produces a list of all open sows currently in the herd.

Action reports - a group of reports can be obtained which schedule labor and other physical facilities. Included in this section are the following reports: heat check, pregnancy check, farrowing and weaning.

Management reports - several reports have been organized which will provide assistance in making breeding, culling and management decisions. These reports include:

Sow performance summary which gives a detailed listing of each parity including performance statistics. A BREEDING VALUE is calculated using the Ohio State productivity and selection criteria. A subjective ranking is also included which takes into account such factors as motherability, farrowing ease, uniformity, soundness in feet and legs, etc.

Weekly production reports give a summary of the weeks activities including such items as sows returning to heat, herd category listing, boar usage reports with conception rates and summaries of farrowing and weaning for the past week.

Monthly production report is similar to the weekly report but also includes comparisons with the same month a year ago and the last quarter, and keeps a running total for the current year. Deviations from producer OBJECTIVES and TOLERANCE LEVELS are listed. For example, your objective might be to wean an average of 8 piglets per litter but you would also like to know how close your target was missed or surpassed.

Boar analysis report - includes a detailed report of the litters sired, conception rates and litter sizes of each active boar in the herd.

INPUTS

The basic inputs to this system are breeding, farrowing and weaning information. The input can be streamlined or expanded to meet the management objectives of the individual producer.

HARDWARE

This system is now available on the ADVANTAGE computer with the capacity to handle 500 sows and up to 3,000 litters. The Advantage has 64K of RAM and 720K of disk storage.

SPECIALTY AGRI SERVICES offers this system on a mail in basis at a nominal fee per sow.

Enquiries are most welcome. Specialty Agri Services will be willing to custom modify the software for other hardware systems.

For more information on this and other computer software and hardware, please contact:

Lloyd Davies, Box 1, Welling, Alberta, T0K 2N0 Phone: (403) 320-0767 or (403) 752-4214

SOFTWARE STORES IN CALGARY

I recently visited a computer store with a big difference. It doesn't sell computers! What it sells is computer software for a vast number of machines. This list includes APPLE, ATARI, CROMENCO, DEC IBM P.C., NORTH STAR, OSBORNE, RADIO SHACK, VECTOR GRAPHICS AND XEROX. The name of the store is the Software Centre, located in the Place Concorde on Sixth Avenue in Calgary. The owner, Cheuk Tam, is happy to let you try out any of the programs he has in stock on the store's IBM P.C. or TRS-80 MOD II. I recently tried out several spreadsheet calculator programs at the store

and Cheuk was always willing to help me out. His programs span from games to several ledgers. I am sure that he would like to sell agricultural programs as well, so the software developers out there might want to talk to him. Lest you think that the Software Centre is the only one of its kind in Calgary, there is another store, Rainbow Software, which is located by Centre Street and Glenmore Trail. This store concentrates on RADIO SHACK, APPLE and ATARI software.

SOFTWARE CENTRE
Place Concorde
931 - 6th Avenue S.W.
Calgary, Alberta
(403) 265-1949

RAINBOW SOFTWARE SERVICES LTD.
7070B Farrell Road S.E.
Calgary, Alberta
T2H 0T2
(403) 253-6142

FARMFAX EXPANDS ITS SOFTWARE OFFERINGS

Farmfax has recently expanded its range of software offerings to include software written by other firms. These firms include FBS Systems, Red Wing, Countryside Data and Tucker. Their products are targeted for the TRS-80 Model I, II, III and APPLE II+ and others. Here is their latest list of software.

DESCRIPTION	HARDWARE	DEMO\$	RETAIL\$
Ag Software Least Cost Feed Mixit	(Apple, TRS-80, IBM, Vector,		299
- Mixit II	(Osborne, Xerox, Kaycomp		568
- Dairy Cattle	(Cromemco, NEC, Superbr.		623
- Dairy Data Disk			190
Ag Pac Software Package (General)	Apple II 64K 2 Drive		1780
Countryside Data- Ag Finance	Apple II 64K 2 Drive 132cl	110	825
- Dairy Herd Management	Apple II 64K 2 Drive 132cl	85	550
- Ag Planner	Apple II 64K 2 Drive 132cl	60	525
- Ag Marketer	Apple II 64K 2 Drive 132cl	60	400
Com Basic Charting	Vector & other CP/M comp	100	1780
Farmfax Tax Programs	TRS-80 II, III, 16	50	1500
Farmfax Tax Form Printing	TRS-80 II, III, 16	50	1500
Farmfax Feedmill System	TRS-80 II, 16	50	4000
Farmfax Swine Herd Perf System	TRS-80 II, 16		2750
Farmfax Farm Records Data Processing	TRS-80 II, 16		4500
Farmfax BASIC Farm Accounting	TRS-80 I, III	50	350
Farmfax ENHANCED Farm Accounting	TRS-80 II, III, Apple, IBM	50	450
Farmfax CORPORATE Farm Accounting	TRS-80 II, III, Apple	50	350
Farmfax Personal Finance	TRS-80 III, Apple II	50	125
Farmfax Crop Management Package	TRS-80 III	50	195
Farmfax Fertilizer Calculator	TRS-80 PC1, Sharp P.C.		60
Farmfax Swine Herd Management - Onfarm	TRS-80 II, III, 16	50	1300
Farm Management Systems - General Ledger	IBM PC	200	656
- Accounts Payable	IBM PC	200	656
- Accounts Receivable	IBM PC	200	656
FMS Dairy Herd Management	IBM PC	200	1232
FMS Commercial Cow/Calf	IBM PC	200	1232
FBS TransAction Accounting w/budget	TRS-80 I, III		834
	TRS-80 II, CP/M		1036
	Apple II		935
FBS TransAction Accounting	TRS-80 I, III, Apple II		737
	TRS-80 II, CP/M		940
FBS Dairy Diary	TRS-80 I, III		839
FBS Micro Mixer	TRS-80 I, III		388
	TRS-80 II, Apple II, CP/M		489
FBS Herd Audit	TRS-80 I, III		535
	TRS-80 II		737
	Apple II		388
FBS Sow Audit	TRS-80 I, III		535
	TRS-80 II		839
FBS Vet H.A.M.S.	TRS-80 II		1649
Homestead- Basic Accounting Package	Vector, HP		2500
- Each Enterprise	Vector, HP		1000
- General Ledger	Vector, HP		1000
- Inventory	Vector, HP		500
- Fixed Assets	Vector, HP		500
- Cash Flow	Vector, HP		250
- Labor Records	Vector, HP		250
- Enterprise Record Keeping	Vector, HP		750
- Enterprise Planning Program	Vector, HP		250
Memorite III Word Processing	Vector		995
Execuplan II	Vector		350
Systems Plus Business Programs: Mods= 1	Vector		1000
2	Vector		1900
3	Vector		2700
4	Vector		3600
5	Vector		4500
6	Vector		5400

Management Services: Commodity - Analyst II	TRS-80 I, III	382
- Driver System Complete	TRS-80 II	409
- Magnum System Complete	TRS-80 I, III	656
	TRS-80 II	711
	TRS-80 I, III	903
	TRS-80 II	1013

DESCRIPTION	HARDWARE	DEMO\$	RETAIL\$
Redwing- Farm G/L/ w/Enterprise Acct	(TRS-80 I, II, III, 16)	115	683
- Accounts Receivable	(Apple II, IBM PC)	115	464
- Accounts Payable		115	409
- Fixed Asset Management		115	354
- Decision Aids		115	217
- Inventory		115	409
- Machinery Management		115	300
St. Benedict's Farm - BEEFUP	CP/M+CBASIC2+48K+2Dr		683
- PEDIGREE	CP/M+CBASIC2+48K+2Dr		464
Tucker Hog Management	Apple II 48K 2 Dr	75	1013
Tucker Feedlot Management	Apple II 48K 2 Dr	75	903
Ag Disk- Farm Accounting Package	Apple II 64K		750
- Financial Management	"		175
- Machinery Management	"		175
- Corn/Soybean Management	"		175
- Market Charting Package	"		563
SF Primary Decisions	TRS-80 I, III, Apple		250
SF Charting for Profit	TRS-80 III, Apple		250
SDS Farm Accounting & Records	Apple II 48K 2 Dr		500
SDS F.A.R.M. Aids (req. Visicalc)	Apple II, III, IBM		100
AMS SHUBOX Financial System (buy 2)	Xerox 820-II	200	1250
AMS SHUBOX G/L only (buy 2)	"		625
AMS Cheque/Draft Writer only (buy 2)	"		625
AMS Feed Formulation	"		1875
AMS Feedlot	"		1875

Mr. Gordon Blackmore
Managing Director
Settler Computer Technologies Inc. (formerly FARMFAX)
101 C Hodsman Road
Regina, Saskatchewan
S4N 5W5
Phone: (306) 949-9393

SPREADSHEET ANALYSIS PACKAGES COMPARED

Description of Electronic Spreadsheets

There have been more micros purchased because of spreadsheet analysis than any other application. The application can affect anyone who has to draw up budgets, evaluate proposals or do any of the myriad of paper and calculator intensive jobs that seem to crop up on the spur of the moment. These applications are "once only" and thus are the hardest to address. It is to these needs that a quick and easy, user programmed package addresses itself.

There are two major philosophies behind these programs. These are cursor driven and procedural language.

Cursor Driven Spreadsheet

These spreadsheet programs have the user manipulating a cursor across a window into a large empty worksheet. This worksheet usually can hold 63 columns and 255 rows, but this is only a theoretical maximum, limited by the amount of memory of the particular micro. When the user wishes to enter formulae or data, he simply moves the cursor to the cell location and types in the information. Formulae are represented by cell locations. If sales are in cell A1 (column A row 1) and expenses were in cell A2, profit (located in cell A3) would be the result of A1-A2. However, with long complicated formulae, it would be difficult to locate the cell locations easily because they may be located outside the window. In this event the better programs have "cursor pointing". This allows the user to move the cursor to the appropriate cell where the actual cell location is automatically entered in the formula. This speeds up design of a spreadsheet. The formulae can be quite complex with mathematical functions such as sin, log, exp or with functions that calculate net present value or averages. There is very little in the way of mathematical transformation that these packages cannot do. A spreadsheet typically has the same formulae repeated over and over again. The cursor driven worksheets can easily duplicate the same pattern of formulae over many rows or columns. This allows great savings in time. There are many options for formatting the cells such as exponential or dollars and cents. The user has complete flexibility in printing out the model, being able to specify any coordinates to define a rectangle to be printed. However, the flexibility is not without its dangers. If someone else besides the developer uses the model and is not completely familiar with the application, a wayward cursor could destroy an important formula. Also, there is no provision for error detection or limits on numeric data. This limits the "turn-key" applications. The cursor drive worksheet is best used by the developer himself.

Procedural Language Spreadsheet

These programs follow a traditional modeling language style by using a set of COBOL like style to define the model. The user designs a program where each variable is given a name, formulae and the locations of input and output variables on the report are defined. In our example of the profit calculation LINE 1 PROFIT = SALES - EXPENSES. Profit, sales and expenses are then given locations on the worksheet. Advantages of such programs is the power of such functions as GROW, where a value can be inflated by a fixed or variable percentage rate. There are often input data checking routines so others can easily use the models. These programs often use files that can easily be used by other programs like data base managers. The problem with the procedural language programs is the perception by users that it is as difficult to learn and use as any other programming language. However, it is usually a matter of which system the user has been first exposed to. Experience with mainframe modeling languages or a programming language will help.

VISICALC

The first and most popular package is VISICALC. It has a very interesting history which typifies the microcomputer industry as a whole. It evolved from the needs of a non-professional in the computer industry, Dan Bricklin. In 1978, Mr. Bricklin was at MIT studying for a MBA when he noticed that his professors spent many minutes recalculating spreadsheets for the many case studies that MBA's have to endure. He wondered if a program might be devised on a microcomputer (he could afford no better) that could make this job a little easier. The story is that he approached one of his professors about the marketability of the idea. The professor didn't think the idea was very marketable (those who can't teach?) but Bricklin and a programmer friend worked on the program in an attic, the rest is history. VISICALC is now available on a wide range of micros. The only area of the market that VISICALC hasn't covered are the CP/M systems. These systems are covered by the Visi-clones (as they are known in the business).

VISICALC	Available on: APPLE II, III COMMODORE 4032, 8032, Super Pet TRS-80 Mod I, Mod II, Mod III IBM P.C. Hewlett-Packard HP 80 series, HP 125 ATARI 800 & 400
	Features: The standard by which others are measured. Many supporting books and specialized models. There are other supporting programs from the same company, VISI-PLOT (plotting) VISI-TREND (regression) VISI-FILE (data base) VISI-DEX (file cards) VISI-Term (terminal) Supports logical functions in newer versions.
SUPERCALC	Available on: any CP/M system IBM P.C. with PC-DOS
	Features: Operates almost exactly like VISICALC Can protect cells containing formulae More formatting options Easier label entry
CALCSTAR	Available on: any CP/M system any CP/M-86 system like IBM or DEC Rainbow
	Features: Help screens to explain commands Can merge files with the WORDSTAR word processing program Complex functions such as linear regression included Automatic input mode for turn-key operation

Summary: SUPERCALC has more features but does not have the advantage of a complete series of supporting programs. CALCSTAR combines some of the features only available on the procedural language programs. There is a new upgrade for VISICALC which will have multi-model consolidation, protected fields, error checking on data entry and variable column widths. This will make VISICALC even more attractive.

SPREADSHEET ANALYSIS PACKAGES COMPARED (PART II)

Some of the major procedural language programs are:

MASTER PLANNER	Available on: Any CP/M system
	Features: Help screens available Sophisticated financial and statistical functions Consolidation of different models
MICROPLAN	Available on: Any CP/M system
	Features: 127 different commands Constantly shows menu on right side of screen Programs of up to 100 steps can be entered for turnkey operation Numbers can be "plugged" into model by specifying row and column locations.

MULTIPLAN

Available on: APPLE
MS-DOS (PC-DOS)
CP/M

Features: Up to eight separate windows into the model can be displayed
Extensive help system which anticipates programmer input
Can read VISICALC files and convert them to MULTIPLAN format.

In conclusion, the procedural language program offers the easiest transition from a mainframe application to a micro, but only for those who have used mainframe modelling packages before. The cursor driven programs utilize the best features of a micro and are easier to learn. They also have the best outside support including newsletters and books. If you are just starting out, a cursor driven program will give quick results with less training required.

Available Products

COMPANY/ADDRESS	PROGRAM NAME	MACHINE/OS	TYPE CD (csr driven) PL (proc lang.)	PRICE (US \$)
Chang Labs 10228 N. Stelling Rd. Cupertino, CA 95014	Profit Plan Micro Plan	CP/M CP/M	PL PL	\$ 195 \$ 495
Comshare Target 1935 Cliff Valley Way Suite 200 Atlanta, GA 30329	Plannercalc Target Planner Master Planner	CP/M, APPLE CP/M CP/M, APPLE MS-DOS	PL PL PL	\$ 50 \$ 195 \$ 495
Context Management 23864 Hawthorne Rd. #101 Torrance, CA 94043	MBA (includes WP & DBMS)	APPLE 3 IBM P.C.	CD	\$ 695
Cromemco 280 Bernardo Avenue Mountain View, CA 94043	Plan Master	Cromemco	PL	\$ 295
Ferox Microsystems 1701 N. Fort Meyer Dr. Suite 611 Arlington, VA 22041	Micro DSS/FINANCE	APPLE	PL	\$1500
Haydon Book Co. 50 Essex St.q Rochelle Park, NJ 07662	Forecast	CP/M, TRS-DOS APPLE	PL	\$ 250
Intelligent Systems Corp. 225 Technology Park Norcross, GA 30092	Colorcalc	ISC 3650	PL	\$ 199
Lifeboat Associates 1651 3rd Avenue New York, NY 10028	Plan-80 T-Maker II FPL	CP/M, APPLE CP/M CP/M	PL PL PL	\$ 495 \$ 275 \$ 745
LOTUS 161 - 1st Street Cambridge, Massachusettes U.S.A. 02142 617-492-7171	1-2-3	IBM P.C.	CD	\$ 495
Micropro International 1299 4th Street San Rafael, CA 94901	Calcstar	CP/M	CD	\$ 300
Microsoft 10700 Northrup Way Bellevue, WA 98004	Multiplan	CP/M, APPLE MS-DOS	CD	\$ 275
Peachtree Software 3 Corporate Sq. #700 Atlanta, GA 30329	Magicalc	CP/M	PL	\$ 300
Phase One Systems 7700 Edgewater Dr. Oakland, CA 94621	Master Plan	OASIS	PL	\$ 425

Radio Shack 1300 One Tandy Center Fort Worth, TX 76102	Spectaculator	TRS-80 Color	CD	\$ 40
Sorcim 405 Aldo Avenue Santa Clara, CA 95050	Supercalc	CP/M, MS-DOS	CD	\$ 290
Spectrum Software 142 Carlow Sunnyvale, CA 94087	Universal Business Machine	APPLE	CD	\$ 50
Structured Systems Gr. 5204 Claremont Oakland, CA 94618	Magic Worksheet	CP/M	PL	\$ 495
Supersoft Associates Box 1628 Champaign, IL 61820	Scratch Pad	CP/M	PL	\$ 200
Vector Graphic 500 N. Ventu Park Rd. Thousand Oaks, CA 91320	Execuplan	Vector Graphic	PL	\$ 150
Visicorp 2895 Zanker Rd. San Jose, CA 95134	VISICALC Desk Top/Plan	Various APPLE	CD PL	\$ 250 \$ 250
Westico 25 Vanzant Street Norwalk, CT 06855	Mini Model	CP/M	PL	\$ 495

(No. 9 - November, 1982)

NEWS RELEASE

Countryside Data Canada Ltd., announces its appointment as the Canadian distributor of Countryside Data Inc., Idaho Falls, Idaho software programs.

Countryside Data's "Farm Management System" is designed to run on a wide range of microcomputers. The Farm Management System includes, AG-FINANCE, a specialized accounting system for farms and ranches. AG-PLANNER, a what if program for planning and Enterprise Reports. AG-MARKETER designed to help make marketing decisions, such as when to sell, at what breakeven. Countryside also handles "Dairy Management".

These programs are designed for the farm manager who desires on farm computer services to provide quality financial and production management information. Users of these programs are not required to have a knowledge of computers or accounting.

A dealer network has been established in Canada. For further information contact Mr. Carlyle Bradshaw, Countryside Data Canada Ltd., 4013 Nipigon Road, Lethbridge, Alberta, T1K 4P8. Phone (403) 320-0792, 320-1230.

(No. 11 - January, 1983)

THE SAGA OF CMS AND HOW YOU CAN PROTECT YOURSELF FROM A SOFTWARE FIASCO

When we purchased our Commodore Pet system almost three years ago, we wanted to obtain a representative general ledger system to show at demos. The system we purchased was a series of programs that included a general ledger, accounts receivable and payable from a company known as CMS software located in Texas. The programs worked admirably until Commodore went through one of its ROM changes on the PET and 2040 disk drive. We then found that the programs would not work because the language and the disk formats had been altered. When we contacted the Toronto distributor of the original program, we found that they no longer supported the program or our older (by two years!!) model machine. They suggested that we contact CMS directly and gave us a phone number which turned out to be for a different company. A search of Texas directories couldn't turn the company up and they had also stopped advertising in the magazines. We assume the company has folded and has taken the original source code with it. We are no slouches as programmers, but the programs are protected and cannot be cracked for modification without many hours of sweat.

Now please don't take this as an attack on either Commodore or any of the principals involved, as even the strongest of firms may disappear overnight. Although the hardware may last decades, the software is much shorter lived. Needs, hardware configurations and rules change, but the software does not. You have to depend on the software house for updates and advice. How can you protect yourself?

One of the easiest methods is to make sure that the software house has a SOFTWARE ESCROW AGREEMENT. This has the software house "bank" the source code (the original statements that made up the program) and documentation with a third party. As changes are made, the current version is made available to the escrow agent. In the event of the company falling into a black hole, the license holders (e.g. the people who purchased the rights to use the software) can go to the agent and obtain copies of all materials that have been banked. If the company (and the ownership of the software) has been sold, the escrow agent can also help you get in touch with the new owners. If you are first time buyers or old hands at buying ag-software, ask the vendors if they have such an agreement. It can be a cheap form of insurance against the "CMS problem".

CONVERTING VISICALC TEMPLATES TO SUPERCALC

Although SUPERCALC is a worthy clone of VISICALC, templates created in the latter cannot easily be transferred to the former. You must type in the listing by hand. Here is a guide to interpretation and translation of these VISICALC templates. The first step to the conversion is to create a VISICALC listing of the template. This can usually be accomplished by the use of the storage command. The procedure differs with the specific version of VISICALC but on the TRS-80 version the command is /SS:P(cr) The VISICALC listing comes off in reverse order from the bottom right hand corner to the top left hand corner with the global commands following last.

The cell number is indicated after the greater than wedge > The start of the information is designated by a colon :

A label will be prefaced by a double quote sign " Any formats or other slash commands are as they are typed.

> (cell location):(slash commands e.g. formats)(labels "xxxx")

- For a label in cell A4 "COST" the listing shows >A4:"COST"

- For a repeating label in cell A4 with =s the listing is >A4:/--

- If the cell has a format e.g. \$ then the label will be >A4:/F\$ "COST"

A formula is represented the same way as it is typed if we have +C33+C48 in cell C53 the listing will have:

>C53:+C33+C48

In VISICALC you will have to type a sign (+ or -) or decimal point or bracket to start off the formula, SUPERCALC does not need this.

A number in cell C53 such as 1200.45 will be: >C53:1200.45

The greatest difference between SUPERCALC and VISICALC is in the calculation order. VISICALC calculates in strict left to right order thus +C4+C5*C6 will add C4 to C5 and multiply by C6. SUPERCALC uses mathematical hierarchy where multiplication and division takes place before addition and subtraction. Thus +C4+C5*C6 will multiply C5 by C6 and add to C4. You will make much greater use of parenthesis in SUPERCALC.

e.g. +C4/100+1 C7 is (C4/100+1) C7

The final set of commands in the listing involve those which are global or window commands. Some of these are:

/W1	One window	/GF\$	Global format of dollars and cents
/GOR	Order of calculation in rows	/GC12	Global column width of 12 characters
/GRA	Automatic re-calculation		

There are some very strange commands which define where the windows are, where the titles are, and where the cursor will be located when the template loads. These commands are often prefaced by a /X command. If you are converting a VISICALC program with lots of /X commands in the listing, the best policy is to see an example and to input the appropriate commands for SUPERCALC. This applies to titles, windows and cursor resting places in particular.

SPECIAL FUNCTIONS translate with no problems except the @ sign is not required in front of the function and ranges are not designated by (...) but by a (:).

There are some differences in specific functions. We will cover all functions from both the old and newer versions of VISICALC (marked with *).

@ABS(value) = ABS(value)

>D47:@ABS(D20) is ABS(D20) in cell D47

* @AND(expression1,expression2) = AND(expression1,expression2)

@AVERAGE(list) = AVERAGE(list)

where a list is a combination of values (D20 or 123.23) expressions (D20-15) or ranges (D32...D35) separated by commas e.g. @AVERAGE (20,D21-1,D32...D35)

>D47:@AVERAGE(D32...D35) is AVERAGE(D32:D35) in cell D47

(only the non-blank entries will be averaged).

* @CHOOSE(value, list) where you choose the nth element in a list has no equivalents. Use LOOKUP with two rows or columns where the first row or column is numbered from 1 to n, one for each element while the second row/column contains the actual data.

@COUNT(list) = COUNT(list)

>D47:@COUNT(D32...D35) is COUNT (D32:D35)

(counts the number of of non-blank entries in the list)

@ERROR = ERROR

@EXP(value) = EXP(value)

The logical functions only apply to recent versions of VISICALC and to all versions of SUPERCALC.

* @FALSE has no equivalent use a 0 in the SUPERCALC formula instead.

* @IF(exp1,exp2,exp3) = IF(exp1,exp2,exp3)

(if exp1 is true then use exp2, if exp1 is false use exp3 instead)

>D47:@IF(A1-1=0,A3*.015,A3*.20) is IF(A1-1=0,A3*.015,A3*.20)

@INT(value) = INT(value)

* @ISERROR(value) has no equivalent

* @ISNA(value) has no equivalent

@LN(value) = LN (value)

@LOOKUP(value, column/row range) = LOOKUP(value, column/row range)

(both languages require the ranges to be in ascending order.)

>C50:@LOOKUP(C49,B1...B13) is LOOKUP (C49, B1:B13) in cell C50

@MAX(list) = MAX(list)

>D47:@MAX(0,@SUM(D32...D35)) is MAX(0,SUM(D32:D35)) in cell D47

@MIN(list) = MIN(list)

@NA = NA

* @NOT(expression) = NOT(expression)

@NPV(discount value, column/row range) = NPV(discount,column/row range)

(the value is expressed as a decimal e.g. 20% = .20)

>D47:@NPV(.2,D32...D35) is NPV(.2,D32:D35)

@PI = PI

The trigonometric functions are the same except for the lack of the @ sign on the function
 e.g. @SIN(value) = SIN(value)
 @SQRT(value) = SQRT(value)
 @SUM(list) = SUM(list)
 * @TRUE has no equivalent but you can use the value of 1 in a logical formula instead.
 Although most of the functions will translate almost word for word, there will be serious problems with any application that uses the DIF format for communicating numbers between templates.

BEST OF VOLUME 4

HOW TO TELL THE TOYS FROM THE TOOLS (Issue No. 1 - March, 1983)

I have received many calls concerning the same question. The caller is looking to buy a cheap home computer for his children which will also be used for the farm for such applications as accounting and physical recordkeeping. There are three routes to get to such an ideal situation. The first is to go ahead and buy the very low end machine and after you get tired of it, sell it or give it away. The second strategy is to buy a stripped down version of a useful machine and expand it later. The last strategy is to buy a used system which will be of greater value but involve greater risks.

Find out which computers are worth expanding (the tools) and which are not (the toys). This is a combination of several factors; the first is technical (the hardware places limits on expansion) and the second is software. Software is most important since all microcomputers can be expanded at differing costs, but there may not be any agricultural or business software when the system is expanded. This limitation is the most damning to many low cost systems. Let's look at some of the issues.

CRT: The screen has to be 80 characters by 24 lines. Anything smaller will not show enough information to be practical. For instance, important reports (like the P&L or balance sheet) from an accounting package will either not be available from the screen (only from the printer) or in two or more abbreviated parts. If you want to see what an 80 column by 24 line screen is like, fold an 8.5 by 11 sheet in the middle, fold it in half lengthwise and you will have a 40x24 screen, by half again and you will have the microscopic 22x23 screen. If the ads say you can hook the computer up to a TV screen, it's a toy (it won't show 80x24 anyway).

KEYBOARD: Take a look at a typewriter and at the computer's keyboard. If the keys are not the same size or in the same location on the main keyboard you are looking at a toy. Another factor that makes a computer a tool is a numeric pad. Most recordkeeping involves a mass of numbers, the numeric pad is the best way of putting them in. The lack of a numeric pad means that the manufacturer is trying to save money on the size of the case which must be larger to accommodate the wider keyboard. Such penny pinching is not worthy of a tool.

RAM MEMORY: A machine that cannot be expanded to at least 64k is a toy. The advertised memory size and the usable memory are often very different. The Commodore 64 advertises 64k RAM, yet it only has about 39k available for BASIC programs. One has to be a fancy machine language programmer to use that extra memory. Ask how much memory is available after BASIC or VISICALC is loaded. The numbers may astound you.

LANGUAGES: Many agricultural programs are written in BASIC, the better the BASIC, the better the program can be without resorting to tricks. The magic question to ask is whether the BASIC is equivalent to MICROSOFT BASIC level 4.5 or level 5. If the computer cannot run one of these packages: VISICALC, SUPERCALC or MULTIPLAN, it may be a toy. There may be other spreadsheet packages available but they do not have the support books, tutorials, pre-programmed templates or support programs such as graphing and file management.

DISKS: Any computer with less than 100k disk drives will have a hard time getting out of the toy category. Don't buy a tool computer without dual disks. All recordkeeping software requires dual disks to operate, since one disk contains the programs and the other disk contains the data. A tool stores information, you need large disk capacity to do this. If the computer has disks packaged in separate units, how easy is it to back-up one disk to another?

OPERATING SYSTEM: Can the computer use the CP/M operating system? This operating system is the standard of the older 8 bit microcomputers. The new 16 bit microcomputers have no such standard but some possible heirs to the CP/M throne are MSDOS, CP/M-86 or UNIX. If the computer can be upgraded to use CP/M, can it also be upgraded to 80 column screens and dual disk drives. CP/M assumes that these features are installed, program transportability is lost if the program has to be modified to work with a smaller sized screen.

AGRICULTURAL SOFTWARE: All of the above hardware factors can be forgiven if there is agricultural software available. This software can be obtained in two ways. From commercial vendors for the recordkeeping programs and from public institutions for the decision making programs. Although there may be some machines with a small number of excellent programs, I think the numbers are on your side when you select a tool that has a large number of vendors and public institutions writing for it.

Here is a chart of some popular microcomputer models, you draw the conclusions.

Computer	CRT	Keyboard	RAM Memory		Languages Basic Microsoft 4.5	1=VISICALC 2=SUPERCALC 3=MULTIPLAN	Disks (k)	Easy Dual Drive Capacity
			Std	Max				
Apple II E	80x24	OK*	64	128*	No	1	143	Yes
Atari 400	40x24	NO	16	48	No	1	88	No
Atari 800	40x24	OK*	48	48	No	1	88	No
Atari 1200	40x24	OK*	64	64*	No	1	88	No
Commodore 8032	80x25	OK	32	96*	No	1	500	Yes
Commodore 4032	40x25	NO	32	32	No	1	170	Yes
Commodore Vic 20	22x23	OK*	5	32	No	N/A	170	No
Commodore 64	40x24	OK*	64	64*	No	N/A	170	No
CP/M (Vector Graphics, etc.)	80x24	OK	64	varies	Yes	123	varies	Yes
IBM P.C.	80x25	OK	16	512*	Yes	123	320	Yes
Osborne I	52x24	OK	64	64	Yes	2	92	Yes
TRS-80								
Color Computer	32x16	NO	4	32	No	N/A	176	Yes
TRS-80 Mod III	64x16	OK	4	48	Yes	1	176	Yes
TRS-80 Mod 12	80x24	OK	80	80	Yes	123	1200	Yes
TI 99/4A	32x24	NO	16	52	No	N/A	80	No
Timex/Sinclair (TS-1000 ZX81)	32x24	NO	2	64	No	N/A	none	N/A

Computer	Operating System	Ag Software	Explanation of Categories
Apple II E	APPLE DOS/ (CP/M*)	E	CRT - Number of columns x number of lines.
Atari 400	ATARI DOS	VP	Keyboard
Atari 800	ATARI DOS	VP	No - Non standard keys or key sizes
Atari 1200	ATARI DOS	VP	OK*- No numeric keypad
			OK - Numeric keypad
Commodore 8032	COMMODORE DOS	P	RAM - Maximum ram can be misleading. Not all of it is easily available to BASIC. Those that have this problem have an * next to the number.
Commodore 4032	COMMODORE DOS	VP	
Commodore Vic 20	COMMODORE DOS	N/A	EASY DUAL DRIVE CAPACITY - includes such things as easy backups and extra BASIC coding needed to access the second disk.
Commodore 64	COMMODORE DOS	N/A	
CP/M (Vector Graphics)	CP/M	VG	Operating System - If (CP/M) is in brackets, this capability is an extra expense. - (CP/M*) means a hardware addition is also required
IBM P.C.	MS DOS CP/M-86, UNIX (CP/M*)	A	
Osborne I	CP/M	VG	Agricultural Software
TRS-80			E = 60 or more vendors
Color Computer	C.C. TRS DOS	N/A	VG= 40-59 vendors
			G = 30-39 vendors
TRS-80 Mod III	Mod III TRS DOS	G	A = 20-29 vendors
			P = 5-19 vendors
TRS-80 Mod 12	Mod 12 TRS DOS (CP/M)	G/VG	VP= less than 5 vendors
			N/A= no significant ag. software from private or public sources.
TI 99/4A	TI 99/4 DOS	N/A	
Timex/Sinclair (TS-1000 ZX81)	N/A	N/A	

Conclusion: When you buy a computer, don't try to make a silk purse out of an electronic sow's ear!

REPORT ON THE 8th WEST COAST COMPUTER FAIR (Issue No. 2 - April, 1983)

This is the second time that I have attended this show, and again I return with red-rimmed eyes and a sense of total exhaustion from seeing so much equipment. In Alberta we are getting only a small slice of what is coming from Silicon Valley. The show was held in the San Francisco Civic Center, a very large building, March 18 to 20. Although the weather in San Francisco was terrible (rain almost every day), I never noticed since there were 440 exhibitors to visit in only 24 hours of show time. This meant only 3 and one half minutes per booth so there was no time to watch the sky. This show is unlike many others in the microcomputer industry because they actually sell things at the booths and there are no flashy exhibits designed to impress other manufacturers as well as joe public. There were many small companies selling their wares. They reflect the actual state of the market (i.e. who is really successful). Third party software and hardware makes a computer popular.

HARDWARE (winners and losers)

The two winners at this show seemed to be IBM and APPLE. There were halls devoted to exhibits on these machines alone. At the IBM booth, the new IBM PC XT with a 10 Megabyte hard disk and 128 k of main memory. The unit is more or less the same as the original PC and will run the same software. They also showed the PC color display unit which seems to be a copy of a unit (called a Princeton Graphics) which comes from Taiwan. The Canadian price for the XT will be \$8000 stripped down and the color monitor will run over \$900. However the color monitor is far better quality than the Electrohome or Amdek monitors that are sold for the same price. IBM showed some new software that is now under their nameplate. These packages included Microsoft Multiplan which is a worthy competitor to VISICALC (nice use of color in this package) and PFS:file which is a file manager. They also showed their new program editors which has two versions: the personal and professional. The former version uses nice color and is almost as powerful and easier to use than the latter which costs twice as much. There is a new version of IBMDOS (version 2.0) which is tailored to use the hard disk. I heard some bad reports at the show about this package, i.e. that it is slow and has some bugs in it. It has since been recalled, so don't buy it until the problems have been worked out.

However, IBM was not the only booth to show IBM compatible equipment. There were many companies that had computers that were very close to the original. The machines were of all shapes and sizes, from the portable (Compaq, Corona, Seequa and Hyperion) to desktop (Eagle 1600, Corona and others). The question of what is exactly IBM PC compatible came up. Some machines can only read and write IBM formatted diskettes and their compatibility ends there. The Texas Instruments Professional Computer and the Dynalogue Hyperion are two such examples. Others like the Compaq and the Columbia Data Systems will run most of the software unmodified. Exact compatibility, (i.e. all programs and data) is not possible since this would involve copying the internal ROM codes of the PC and put any company which does this in grave legal danger (hasn't seemed to stop the APPLE clones though). There is one machine which gives you a portable IBM PC with no compatibility problems. This unit, called a COLBY PC-1 has you take out the guts of your PC and install them in a portable case with a 7 inch screen, power supply and room for one disk drive. They also sell a board to turn the empty PC case into an expansion chassis for a fraction of the cost of one from IBM.

The other star of the show was APPLE with a vast amount of third party hardware and support for the new APPLE II-E. It was hard to get close to their booth where they were displaying the LISA. This computer will cost about \$14500 Canadian. The LISA represents a new way of interacting with a computer. Instead of using cursor keys and complicated commands, you use a little box that rolls on a table top called a mouse. When you move the mouse on the table, a little arrow on the screen moves in the same direction and velocity. You just move the arrow to the appropriate menu item and press a button on the mouse. The LISA uses pictures for many of the menu items, called icons. If you want to file something you move the file to the icon of a filing cabinet, to destroy a file you move the file-folder icon to the garbage-can icon. This is supposed to simulate your desktop in the computer (I think mine must be far too messy to simulate!). It comes with a powerful set of software that includes LISACALC (like VISICALC), LISAGRAPH (where you can graph numbers very easily), LISAFIL (a file manager), LISADRAW (a freehand drawing and drafting program that uses the mouse as the major input device), LISASCHEDULE (draws beautiful PERT and GANTT charts for anyone who has to manage a project). The machine has memory galore, 1 megabyte of main memory and about 7 megabytes of disk (hard and floppy) storage. Although my description sounds facile, I assure you that a demo is exciting and convinces me that the wave of the future is in machines like this one.

Other potential winners at this faire were the DEC RAINBOW 100 and the TEXAS INSTRUMENTS PROFESSIONAL COMPUTER. The former seemed to be getting a lot of third party software support, i.e. they were converting their programs to run on this machine from the IBM PC. The machine has a dual processor so it can run all of the CP/M software as well. The prices are similar although expansion is more expensive because it is only available from DEC while there are dozens of companies producing extra memory boards and the like for the IBM. The TI unit has a large amount of third party software that has been licensed to be sold under the TI name. This may have some disadvantages since this policy initially hurt IBM which had a ceiling on royalties that could be paid out to the program authors. I hope both these companies disclose the vital information on both the hardware and the kernel operating system like APPLE and IBM have made. If they don't, they will be also-rans.

Appearances at the show were made by Tandy-Radio Shack and Commodore. The amount of third party support for the Radio Shack equipment seemed less than last year. The Radio Shack booth exhibited the new TRS-80 model 12 which replaces the model 2 (That's why they are being sold so cheap in Canada!!!). This machine while having some nice numbers (80 k memory and 1.2 megabyte disk drives), it is not a 16 bit computer like any of the others in its price range. Tandy still doesn't offer CP/M as an option and thus is restricted to a smaller slice of the software market. Although you can obtain CP/M from third parties, Tandy does not seem to recognize that it is the standard operating system of most 8 bit micros. No changes to the TRS-80 Mod III though. Rumors abound of a replacement. Tandy had better hurry. Commodore has a winner with it's VIC-20 which was widely supported by both software (games, mostly) and hardware vendors. The jury is still out on the Commodore-64 which only had a trickle of software (again, mostly games) but the machine is still young and has a good price/performance ratio on the hardware. The problem seems to be machines that can compete in the higher end business market. They showed some prototypes of equipment but these were the same ones that have been shown in shows six months earlier. Their current equipment offering of the 8032 and Super-Pet are aging and will become less competitive as the 16 bit revolution marches on. TEXAS INSTRUMENTS seems to be putting a lot of work into their TI-99/4, with new business style packages such as MULTI-PLAN. They also say that there are software houses in Texas that are starting to put out ag-software for that machine. The Japanese had a new set of computers that had extremely good color and graphics. The HITACHI MB16001 as an example had astounding graphics, 700 x 400 resolution in 16 colors. There seemed to be a consensus that the Although you can obtain CP/M from third parties Tandy does not seem to recognize that it is the standard Japanese were still 2 years away from a market breakthrough because of the lack of good nationwide distribution and support. Many of the machines used CP/M, MSDOS, or CP/M-86 as their operating systems and thus solved to some extent the software unavailability problem.

In the portable computer stakes, OSBORNE has a strong competitor in the KAYPRO-II. This computer offers 400k disks, 64k of memory, a 9 inch 80x24 screen and 10 standard software packages wrapped in a metal case for about the same cost as an OSBORNE-I. This machine is being sold in Alberta by Data Terminal Mart and is worthy of

notice by anyone looking for an under \$3000 portable computer. In the smaller portable computer stakes there were two machines of note, the EPSON HX-20 and the TI COMPACT COMPUTER 40. The EPSON had a full sized keyboard, 16k memory and a 4 line LCD display for about \$800 US but had very little software. The TI was in a smaller package with 6k and and one line display for \$250 U.S., but has a wider range of software in solid state modules, much like the old programmable calculator the TI-59. Tandy has just introduced a portable called the Model 100 which has prices and specs similar to the EPSON.

In the add-on market there were a lot of mice available although no software was available to use them. Color monitors were in evidence at increasingly lower prices. There were even color graphics printers available for as low as \$600 U.S. I think 1983 will be the year when affordable color graphics becomes available.

SOFTWARE

The new term that is being bandied about this year is second generation software. This is software that combines several different functions into one large program. The LISA would be considered to be second generation because it is so easy to get from one application to another using the same data. An application that combines a spreadsheet analyzer with a graphics package with a data base manager with a word processor and a communications package would be second generation. This package already exists for the IBM and is called MBA. Another package for the IBM called 1-2-3 combines the first three functions into an extremely powerful package. Since we have since purchased this program for our office IBM-PC, there should be a review soon. This second generation software requires a massive amount of memory, usually 128k just to load. This makes memory expansion even more critical to the prospective hardware purchaser. There is also a series of software while not second generation is more like the VISI-series of software. That is, they share common data file formats. This new series is from PERFECT SOFTWARE and includes PERFECT CALC, PERFECT FILER, PERFECT WRITER, and PERFECT SPELLER. The programs were fairly low cost and are standard equipment on the KAYPRO-II. The programs run in CP/M, and IBM PC compatible machines. Getting away from the serious software, the games were very much in evidence at the show. The most popular machines for this kind of software were the ATARI, APPLE and VIC-20 with SINCLAR ZX-81, TRS-80 Color Computer and TI-99/4 close behind. Some games that caught my eye were those which allowed you to design your own custom games. This included the Arcade Machine from Broderbund software and the Pinball Construction Set from Budge Co. The former allowed the user to define what kind of aliens to shoot down and how (Revenue Canada invaders?) while the latter would have the user design an electronic pinball game from bumpers and bells to flippers. The language LOGO was also in evidence from displays of user groups and vendors. This language was designed to teach children how to program a computer by telling an object called a turtle how to move on the screen.

MISC.

Now that people are out there buying up great masses of computer hardware and software, there is a growing market for training. I saw video tapes for training in VISICALC and other popular software packages. There were ads for training courses which would last one or two days and cost a fair packet of money. I think this will be one of the growth areas for anyone willing to set up courses. However this has risks for the novice. Since there are no standards for the trainers, i.e. no professional degrees in microcomputers, how does the novice separate the good courses from the bad. Training will become as difficult to buy as hardware and software. Another interesting trend was the commitment of the traditional book publishers such as McGraw-Hill to enter the software market. Although this was evident last year, the offerings were somewhat trite. This year they have released some very powerful and inexpensive software. This may spell the end of the large software house that has a staff of full time programmers. Instead, the publisher will buy the rights from an independent and pay royalties just like any book. The days of the kitchen table software house are not over, and the price of good software should decline because of mass distribution.

TRS-80 MODEL 100 REVIEW (Issue No. 3 - May, 1983)

The first news I heard of the Radio Shack TRS-80 Model 100 portable computer was in the May issue of Popular Computing. I was amazed at the speed at which the machines arrived on the dealer's shelves. I obtained one from the local dealer in Olds for a review. In fact, this review is being typed on a Model 100. My first thought when I saw the machine was to compare it to other portable computers on the market.

Let's compare the Model 100 to machines like the Osborne and the Kaypro II. First, the sizes: The Osborne weighs 26 pounds while the Model 100 weighs 3.5. The Osborne is the size of a large portable sewing machine, the Model 100 is the size of a two inch thick notebook. The Kaypro has 64k RAM, and the Model 100 has up to 32k. Load in Microsoft BASIC on the Osborne and you get 29k free, the same as the Model 100 which has its BASIC in ROM. However, the biggest difference is the dependence of the Osborne and Kaypro on an electrical wall socket while the Model 100 uses AA and Ni-Cad batteries. This gives true portable operation. Comparing to other portables, the Model 100 has a full size keyboard while the TRS-80 PC2 and the Panasonic HHC have munchkin-size keys. The LCD display on these machines and the TI Compact Computer 40 (just introduced) have a one line display, while the Model 100 has eight lines of 40 characters. In fact, the display is the largest of any of the LCD displays on the market. If you want a bigger display, spend \$12,000 on a Grid Compass.

The closest portable to the Model 100 is the Epson HX-20. The Epson can have a built-in 32 character printer and a mini-cassette drive. The display had to be shrunk to fit these extras. The Model 100 has several interfaces for external printers, cassettes, bar code readers, and modems. This gives a better choice of peripherals and maximum display size; I think a worthy trade.

When you turn the Model 100 on, you are presented with a menu which contains five items: BASIC, TEXT, TELECOM, SCHEDL and ADDRSS. There may also be files stored in memory from BASIC, the text editor or any of the other programs. This is because the memory of the Model 100 retains its contents even after the unit is turned off (there is a built-in Ni-Cad battery charged by conventional alkaline AA batteries). After you select TEXT by positioning your cursor over the word, you enter the text editor. It is a good full screen, character oriented editor with word wrap (a full word is not cut when you reach the end of a screen line) which allows the user to insert,

delete, move and copy text with simple keystrokes of the eight special function keys. It has one function which isn't on most expensive work processors. If you cut out some text, you can undo the change by pressing the "paste" key. This is also used to move or copy blocks of text. The text can be saved into memory or cassette when you are finished or printed with no formatting options. The Model 100 is designed to have the user enter the text "on the road" and then communicate it to a bigger word processor. The keyboard has a very good feel to it which makes it a joy to use.

When you select BASIC, you enter one of the best versions of Microsoft BASIC I have ever seen. It equals the IBM PC BASIC in its richness and power. Graphics and device handling (modem, printer and cassette) commands are especially good. When you change program lines you have a full screen editor courtesy of the TEXT editor. This is a refreshing change from that horrible line editor that the Model 2 and 3's have! It's fun having a BASIC like this in such a small package; I wouldn't see any problems in transferring BASIC programs to the Model 100 (except for the difference in screen sizes).

The ADDRSS (address) and SCHEDL (schedule) programs are identical in their function. Files created by the text editor can be scanned for dates, names, addresses or anything else you want to find. It just searches for a string in the file, no complicated stuff. These utility programs are handy but I think they're window dressing, and hope they didn't take up much space in the ROM (they probably didn't).

The most exciting program is the TELECOM communications package. The Model 100 has a direct connect modem which can dial numbers from the address file and upload (transfer to) and download (transfer from) text or programs from any other computer. I dialed the University of Alberta and conducted a terminal session with no problems. The 40 character screen was not the best for viewing tables, but it was better than a 32 or 22 character display.

You can get the computer to automatically dial a person on your address list by using the FIND and CALL functions. This is the ultimate in automatic telecommunications with a personal computer. When you buy your modular phone jack cord, you get a free hour on the CompuServe and Dow Jones information services, a nice touch. The direct connect modem only works at 30 characters per second (300 baud). If you want higher speeds such as 120 CPS (1200 baud) you will have to connect a separate modem to the built-in RS-232 port. Also, if you do not have a modular phone jack available, there is an optional acoustic coupler attachment.

If I gave stars in my reviews, I would give the Model 100 five of them. But it is not a machine to replace a proper desk bound business system. You can spend \$1100 for a self-contained Model 100 and not have to sink another nickel into it. There is absolutely no software available for the machine yet, so don't buy one if you don't intend on doing your own programming. This is a cassette based machine and thus it is unlikely to be suited for heavy record keeping purposes (I couldn't get the cassette interface to read data properly). If you have an application for a second computer (writing on the road), portable operation (data logging on site) or training (learning how to program), the Model 100 is the best of the bunch.

REVIEW OF 1-2-3 FOR THE IBM-PC (Issues No. 4 & 5 - June & July, 1983)

What do you say about a program that combines 3 expensive functions into one \$700 package? What do you say about a program that requires 128K of RAM and two 320K disk drives just to operate? I would say it could only be 2nd generation software running on a powerful 16 bit computer like the IBM-PC, which really justifies the purchase of such an expensive piece of equipment. When we bought our PC's, the only software available was re-hashed APPLE or CP/M software. Nice, but not too original. With the advent of packages like 1-2-3, you really have a reason to expand your PC to 256K and beyond. 1-2-3 was designed by Mitchell Kapor, the same person who wrote VISILOT-VISITREND and it shows. This program can be described as the combination of a spreadsheet calc, graphics package and data file handler in one large program. And what a program it is, over 256K of code and help overlays. That's why you need 320K disks and a large memory.

When you purchase 1-2-3 you get a fat binder of over 350 pages, four floppy disks, a pocket guide and a slip-on function key template. An experienced user of spreadsheet programs wouldn't have many problems learning 1-2-3, but what about the novice? There are three ways to learn with 1-2-3. The first is to read the manual from cover to cover. The manual is clearly written (and typeset) but lacks the step-by-step tutorial format of the VISICALC manual. The manual contains a good index and glossary, something that other manuals should always include as a matter of course. (The manual should look good on your shelf next to all the other standard IBM documentation since it has a slipcovered binder format with similar sized pages). Another way to learn the program is to jump into it and use the very powerful help features. If at any time you need clarification on any command, just hit the F1 key and a menu of help screens will come up. Just steer the cursor to the area you want and you can get a very detailed description of the command and it's usage. When you exit the help system by pressing the ESCape key, you return back to the same place in the program that you left off. The help file occupies 177K on the system disk. That's more than the total storage capacity of our old Commodore 4040 or TRS-80 Mod III disks!! The final way to learn 1-2-3 is to use the tutorial disk. This makes up for the lack of such a section in the manual. The disk tutorial looks just like a 1-2-3 screen with prompts on the lower half of the screen. You just read the directions and type in the requested commands. This tutorial is pure Computer Aided Instruction (CAI) and covers all aspects of the system from entering in numbers and formulae to graphing and data manipulation. If you can read or even just press buttons, you should have no problem learning 1-2-3.

When you first fire up 1-2-3 what do you see? You see a menu with a cursor positioned over one of these 5 alternatives: 1-2-3 (the main program), File manager (housekeeping functions for the data disk such as copy, erase, rename, archive or sort), Disk manager (formats, copies and compares whole diskettes), Graph (change disks to get the graph printing program) and Translate (convert VISICALC templates and DIF files to 1-2-3 format). Let's look at the utilities first. The File and Disk manager are the standard housekeeping functions for maintenance of a data disk. They are of course fully menu driven and have help screens available. You could do these functions in the IBM DOS environment but you don't have to. In other words, you never have to leave 1-2-3 to do anything. In VISICALC or any comparable spreadsheet program you must go into IBM DOS to make disk backups and to check remaining space on a disk. The Translate program allows you to convert VISICALC format files to the 1-2-3 format. I have seen some calc programs that claim VISICALC compatibility but never seem to come through with COMPLETE

translations. For instance the CALC-RESULT program that is so highly touted for the Commodore 64 will not translate the LOOKUP function in VISICALC. Since all of our tax templates use this function, CALC-RESULT models must be completely re-written. I believe that most, if not all, IBM-PC users have VISICALC. They are going to want to migrate their templates to any new package that they buy. Anyway, to make a long story short, the conversion was completely successful with no hitches at all. The Translate utility will also convert DIF files to 1-2-3 worksheet files and back again. There are other ways to transfer "foreign" data into 1-2-3 using the FILE IMPORT and EXPORT features, but I will cover these later.

When you select the 1-2-3 option, you jump into a dream spreadsheet program. Anyone who has used VISICALC (the older versions) and has said "I wish it could do this" has the answer to his prayers. When you press the '/' key you get a quite different menu from what you are used to seeing. This menu has Worksheet, Range, Copy, Move, File, Print, Graph, Data and Quit as the major headings. Worksheet allows you to set the traditional factors such as column widths, titles and windows. From this menu you can insert and delete columns or rows. You can also set number formats for the whole worksheet. These include fixed (you specify the decimal places), Currency (floating \$ in front of the number), Date (three different ways), and percent (with a trailing % sign) as well as the regular formats available to older spreadsheets. The recalculation method can be set to either rows, columns or natural, i.e. recalculate as many times as needed to update all formulae.

The Range command allows you to set the format, erase, protect cells from tampering, or restrict the cursor to a specified block of cells in the matrix. Instead of always having to specify a block by it's coordinates (A1 to H25 for instance), you can name a block and refer to it for copying, moving or even referring to it in formulae. The Copy command allows you to take a range of formulae and copy them somewhere else. There is a major difference between the Copy command and Replicate of VISICALC. In VISICALC, you have a chance to give the constant variables in a formula by answering "No change" to the replicate command (this is important for things like interest rates that apply to several formulae). In 1-2-3 the constant variables must be specified in the original formula by imbedding a dollar sign in the constant. I.e. if B5 is the constant in $+(1+A5)*B5$ you must write $+(1+A5)*\$B\5 to specify B5 as a constant. Although this seems clumsy at first one gets used to it. The Move command is much more powerful than it's counterpart in VISICALC. In the latter, you can only move whole rows or columns while in 1-2-3 you can move a block (explicitly designated as D6:J17 or a named range) from any where to any other location. This means you don't have to design the worksheet on paper to get the final design on the computer. 1-2-3 also automatically adjusts the formulae to take the block move into account.

The File command allows some pretty fantastic things to be done. You can of course save and load worksheet files from the disk but the whole directory of your data disk is available if you forget a name. You can also get the amount of space left on a data disk, so you can never be left without space. You can Import and text file into 123 with one command, no DIF's required. If you wish to save only a part of a spreadsheet or combine several spreadsheets into one, there are commands for that. The Print command can have many formatting options like borders, margins, headers and footers. The range you give as the print region (which can also be named) is stored with the program so printer setup commands are only given once.

The Graph command is the most interesting command of all. After you have designed a great spreadsheet, you can jump into the graph command and request a bar, X-Y, line, stacked bar, or pie chart. You give titles and other information to get a graph on the screen (ONLY IF YOU HAVE A COLOR GRAPHICS BOARD!) or to be saved for later printing. Like the print command, the settings for the graph command are stored with the worksheet. The naming feature is also available here. If you have a worksheet with several different tables with different types of graphs, the graph descriptions can be named and called in at will. Once a graph description is set, a touch on the F10 key will immediately re-draw the graph on a graphics screen. This is quite useful for what-if situations where you change one item and you want to see the results. When you print the graph using the GRAPH program, you have many more options to follow. This program supports a wide range of graphics printers including EPSON's, IDS and others with plotters like the HP7470. However, 1-2-3 may not work with your printer, so check it out before you buy (that's why I like EPSONS, they seem to work with everything!). The graph can be printed out with several fonts that range from Script to Roman to Italic. The size and rotation of the final graph can be specified so that you can even print a tiny graph on a 45 degree angle! If you have a plotter or color printer, up to six different colors can be specified. (More next month)!

EXAMPLE OF A HELP SCREEN

A1:	HELP	Help Status Indicator
Worksheet, Range, Copy, Move, File, Print, Graph, Data, Quit,		Command Line
Global, Insert, Delete, Column-Width, Erase, Titles, Window, Status		
----- 101,275 -----		
"@Functions" An "@ function" is an instruction for 1-2-3 to calculate a		
----- value. You may use a function anywhere you'd type a number --		
in a numeric cell entry or at a command prompt. When you press DY, 1-2-3		
the function's value and processes the entry as if you had typed the value itself.		Help Screen Text
All function names begin with the character "@". With most functions, you must		
also enter one or more "arguments", enclosed in parentheses. Here are some		
examples of function usage:		

Alone:	@SUM(A12..D25)
In ordinary arithmetic:	+C12*12.5/@COUNT(I10..I40)
With other functions:	@MAX(5000,@AVG(B5..B12))

There are several types of functions:

Mathematical
Special

Financial Statistical
Logical Database Statistical

Date

Menu Items for Further Help

Arguments to functions

Help Index

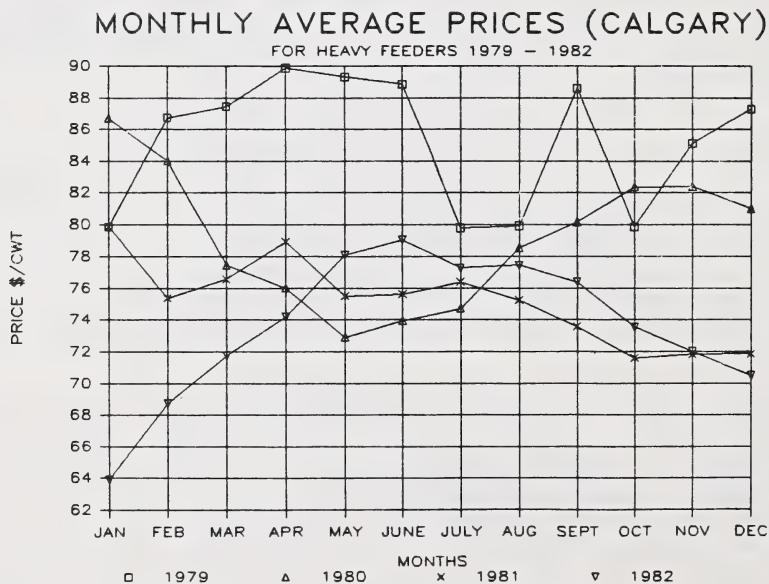
The last command, Data, allows you to turn 1-2-3 into a simple file handler. A table of data can be set up where each row is like one card of information and each column is a category within that card. After telling the Data command the range of data that you are using, you can extract data according to a criteria (if column C is less than 25 and column E is equal to 50). A separate table can be created with the extracted records. You can also sort data by two different sort keys as ascending or descending order. The data rows can also be deleted according to a criterion (i.e. delete all rows where column E equals 50). Frequency distributions can also be calculated automatically on a table. All of this data manipulation must be done on the information in memory, so heavy data storage is best left to the data base managers such as DBASE II. The maximum amount of data that can be manipulated with about 500K of main memory is 2048 rows and 256 columns. I would hate to see how slow such a huge model could be!

Now that the commands have run through, we can cover some of the other niceties of 1-2-3. One of the common "I wish" statements about VISICALC is the need to center labels, not just left or right justify them. If you enter a label after hitting the caret (^), the label will center. A label that is too long to fit into one cell will spill into any empty columns to the right. There are a whole series of keyboard macros which will create a self-prompting spreadsheet for use by untrained personnel. This allows you to write in 1-2-3 language just like in BASIC or DBASE II. We have only started to get into this feature, it is the most advanced in 1-2-3. Like VISICALC and SUPERCALC there is a wide range of built-in functions to SUM rows or calculate the Net Present Value of a data range. 1-2-3 adds some very advanced functions like:

@MOD(x,y)	: calculates x mod y
@RAND	: gives a random number between 0 and 1
@IRR(guess,range)	: calculates internal rate of return of range based on a starting guess
@FV(prn,int,term)	: calculates future value of (PRiNcipal) based in INTeRest for a certain TERM
@PV(pmt,int,term)	: calculates present value of (PayMeNt) based in INTeRest for a certain TERM
@PMT(prn,int,term)	: calculates a loan payment from the principal, interest and term
@DATE(yr,mnth,day)	: calculates the number of a certain date (great for ROP calculations!!!)
@DAY, @MONTH, @YEAR)	: calculates the day, month or year from a certain date number
@TODAY	: gives today's date number (also great for ROP)
@STD(list)	: calculates the standard deviation of a list
@VAR(list)	: calculates the variance of a list

The statistical functions can be applied to a database according to a criterion. This could answer the question "what is the average weight of animals born on a certain date" with a single function.

To conclude, I don't think there are enough superlatives to apply to 1-2-3, it must be seen to be believed. Although no program can be a panacea, I think that for planning and data manipulation purposes 1-2-3 may be the only program you will ever need, IF you are willing to learn how to use it. If you only want to push buttons in response to a canned program, then don't bother. For those unlucky enough to own other equipment besides IBM, don't fear, 1-2-3 is being converted to DEC Rainbows, TI-PC and a host of other advanced personal computers.



You may have surmised from the preceding tax article that the days of buying the computer and the software separately may be numbered. The bundled system that includes software may be the best way to go. Last year at this time, I reviewed the OSBORNE which was the first microcomputer system to offer transportability and bundled software for a low price. Since success always brings imitation and competition, there has been a flood of OSBORNE type micros hitting the market. One of the most successful is the KAYPRO II (first known as the KAYCOMP when I first saw it at the 7th West Coast Computer Fair. I was invited by Allen Hamaliuk of Data Terminal Mart to take one for a week long spin. As I now have a fair amount of experience with Osborne equipment, I could compare these two machines for a head to head battle. Here are the results from the front:

Hardware: The KAYPRO seems to have the upper hand in this battle. It has a boxy metal case measuring 8"H x 15"D x 18"W which are not much different from the OSBORNE. There are many cooling vents throughout the case which has the KAYPRO running cooler than the OSBORNE but don't take it out in the rain!, too many places to let the water in (score one for the OSBORNE). The case has a flat bottom which folds out to be the keyboard. There are little rubber feet in the keyboard and the main unit, the OSBORNE has only plastic skids. The OSBORNE sits like a lopsided sewing machine when closed up, the KAYPRO is not lopsided, just boring old cubic. The keyboards are much the same. The KAYPRO has a caps lock key with a little light in it that is impossible to see from an angle. The cursor control keys are in a straight line on the KAYPRO while they are arranged in a diamond pattern on the OSBORNE (I prefer the latter). The KAYPRO has an electronic click when you hit a key, encouraging for non-touch typists like myself. The best feature of the hardware is the 9" green monochrome screen which shows 80 characters across with no eye strain (the OSBORNE has a 5" screen!!!). The disk drives are stacked up to the right of the screen and have 195K of storage. This is equivalent to the OSBORNE double density format which improves on the original 95K disks earlier OSBORNE users had to suffer with. One annoying "feature" of the KAYPRO drives comes from the drive busy lights. When the drive is selected as the default drive, the drive busy light stays on all the time. This light should only be on when the drive is actually spinning to show you that it is busy and not to remove the disks. You can't tell when a KAYPRO drive is busy unless you listen to the motor, not too easy in a noisy room. However the KAYPRO does redeem itself in another area, the location of the interface connectors. The OSBORNE has it's interfaces sticking out the front and you typically have printer cables hanging over the keyboard! The KAYPRO has these at the back of the box where they belong.

Software: Let's look at the Kaypro's software, all 10 disks worth.

The Kaypro offers CP/M as its standard operating system. The Kaypro has a very clear and well written first-time user's guide. This shows how to start the computer and to get a application package running. However the CP/M manual is the original Digital Research incomprehensible version. Best get a good second source manual on CP/M like "The CP/M Users Guide" by Thom Hogan. Two very interesting utilities that are included with the Kaypro are INITDISK and SETDISK. These allow the user to create, read and write disks in these formats: Osborne single and double density, Xerox 820 single and double density and CP/M formatted TRS-80 Mod I diskettes. This allows the user to migrate software from those machines to the Kaypro. I wish more computers had this feature built in. Other utilities include COPY (creates new formatted diskettes, copies old ones and creates autostart sequences i.e. put in the disk, turn on the machine and start an accounting package without having to type in any commands). BAUD and CONFIG change parameters such as the baud rate of the serial port (how fast the serial port sends out data), sets type of printer, change cursor key and special function key definitions.

Also included on the disk is the Basic language S-BASIC. This Basic is compiled (it translates all of its statements into machine code before execution) and thus is faster than the standard interpreted Basics (which translate statements into machine code as the program gets to it). The language is of the structured variety where all variables must be declared as numeric, string etc. and contains such statements as WHILE-DO, REPEAT-UNTIL, and IF-THEN-ELSE. S-BASIC does not use those pesky line numbers that most Basics need. But, there was a noticeable lack of screen control statements that allow the programmer to put text on line 13, column 24 easily (my favorite location!). So why hasn't S-BASIC taken over the world from good ol' MICROSOFT BASIC?? The latter language is more common and has become a de-facto standard of Basic. You cannot take a program from MICROSOFT BASIC and have it run on S-BASIC without a fair amount of conversion. I think this fact has sunk in to the makers of the Kaypro since they offer MICROSOFT BASIC on the second disk in the standard package. So by all means you can use S-BASIC for your own work but don't expect the program to run on anything else besides a KAYPRO.

The MICROSOFT BASIC disk contains two versions of the language: level4 and level5. The major difference between the two levels is that level5 must have spaces between its keywords i.e. IFA=1THENQ=5 is illegal, it must be: IF A=1 THEN Q=5. This language gives the owner access to all the public domain programs published by users groups, magazines and others. The manual for MBASIC is just a reference manual, you will have to buy a tutorial book somewhere else. Also included on this disk are three very nice machine language (FAST!!) games: CATCHUM (like PAC-MAN), LADDER (like DONKEY-KONG) and ALIENS (like SPACE INVADERS). They seem to throw in everything INCLUDING the kitchen sink on this machine!

Disk number three contains the spreadsheet analyzer called PROFIT-PLAN. This package is of the command language variety rather than the cursor driven style of SUPERCALC. To do anything in PROFITPLAN you must pick an action from a menu displayed on the side of the screen. This package seems only good for cashflow tables as it has a command, GROW which will inflate costs etc. but lacks @LOOKUP or logicals which would make the package useful for tax calculators and the like. The manual is not fancy but readable and has many examples and screen drawings. This was one of the original packages supplied with the KAYPRO and is included for historical purposes only, since PERFECT CALC, the package on disk 4, is a big improvement over PROFIT PLAN.

The PERFECT CALC package supplied on disk 4 is the first in the PERFECT software series and is somewhat typical of all of the software in that line. The manuals are typeset in an easy to read style, organized as tutorial and reference sections with pocket reference cards and good indexes. There are lots of illustrations although they do not always match what you really see on the screen. This is due to the large number of machines that the PERFECT software series run on. This transportability is one of the greatest problems when you use a specific hardware combination. All commands use control code sequences (holding down the control key and one other key e.g. control

and X) or the use of the escape key. These keys are available on almost any keyboard and transportability requires the use of the lowest common denominator. PERFECT CALC has a mass of control key commands that must be memorized - thank goodness for pocket guides! Just moving the cursor requires some not-so-obvious control codes, such as control B to move the cursor left and control F to move it right.

In many packages the E,S,D and X keys move the cursor in a diamond pattern, i.e. control E is up, control S is left etc. I think if you have worked with a spreadsheet program before, PERFECT CALC will take some getting used to, but with its excellent documentation a beginner won't notice the difference. The built-in functions are similar to SUPERCALC with some extensions such as net present value. It is in the area of multiple spreadsheets that PERFECT CALC really shines: you can have up to seven different spreadsheets active at any time with two of them displayed on the screen. Data from one spreadsheet can be linked to another for such things as consolidations of quarterly reports etc. To get you started there are many sample spreadsheets included on the disk for you to examine and apply. One of the nicest features of PERFECT CALC compared to SUPERCALC is the use of standard (ASCII) data files to store the models. This means you can create and edit files with other programs or transfer data easily to other programs. SUPERCALC however, uses a format only understandable to itself. An example of data transfer would have an accounting program take the monthly totals and put them into a file for the PERFECT CALC cashflow and budget analyzer to use. In the final analysis, PERFECT CALC may take a little longer to get up to speed but you can go farther with it than SUPERCALC.

PERFECT FILER on disk 5 is a different matter. It calls itself a data base manager but it lacks the feature that a true DBM system has; the ability to use more than one file at a time. It is thus a file handler with the ability to store and retrieve information. The information can be organized as records of up to 70 fields and 1024 characters per record. That is, each person or thing you want to record may have up to 70 separate pieces of information just as long as the total length of that information doesn't exceed 1024 characters. The system also handles form letters created with the word processing package and can also create customized reports whose formats can be stored on the disk. The system is particularly suited to mailing lists but could not handle more complicated functions such as home ROP as the program cannot perform calculations. For this you would need DBASE II (available at extra cost).

The flagship of the PERFECT software line is PERFECT WRITER. It uses three disks: one to configure the printer that is to be used, one to contain all the tutorial files, and finally the third which contains PERFECT WRITER proper. PERFECT WRITER is one of the most powerful text formatter programs I have ever seen on micros or mainframes. Note that I didn't call it a word processing package. The distinction between the two kinds of packages is simple. The word processor shows you on the screen exactly what you will see on the paper. You set up the margins and other factors with special key commands before you type in the text. The text formatter has you type in the text with wild abandon and formats it only when it goes onto the paper. Margins, line spacing and other factors are imbedded into the text with format commands such as @STYLE (left margin 10 characters) which sets the left margin to 10 spaces. These commands are identified by a @ sign in front of it. This gives you the capability to create tables of contents, indices and footnotes. One of the most powerful features is in-text referencing?. For example, if you want to refer to the "red tractor" on page 10, but later on if you insert or delete pages while editing, the computer keeps track of whatever page "the red tractor" ends up on. PERFECT WRITER will keep track of the location of references, great for tables of contents, etc. A different philosophy than WORDSTAR (a popular word processing package on the OSBORNE), but in many cases far superior, especially if you are writing a school paper or a non-fiction book. Just cranking out letters may favor the word processing philosophy. Like PERFECT CALC, PERFECT WRITER can allow you to view and edit two documents at the same time, with full transfer of text between them. One nice safety feature has the file written out to disk automatically every few minutes so that in the event of a power failure you only lose a little bit of the text since the last save.

Disks 9 and 10 contain two different spelling checkers, PERFECT SPELLER and THE WORD PLUS. PERFECT SPELLER has a 50,000 word dictionary but can actually check many more words than that. It checks the root of the word i.e. BIG and then checks for any suffixes or prefixes i.e. bigger bigEST. It is fast and seems to catch most of the words except for proper names of course. THE WORD PLUS is even more powerful. It has a 45,000 word dictionary which will find words that aren't in the dictionary and help you find the closest correct spelling for the word. It can also hyphenate words, count the number of words (great for magazine freelancers!) and find the frequency of each word (to find the reading level of the article). The final two functions are great for SCFABBLE players and poets. If you type in H?T?O?S it will find all the words that have H,T,O, and S in the locations indicated (HOTDOGS!). If you type in TEST* it will find all the words starting with test. The Anagram function will find all the proper combinations of a series of letters i.e. STAR is also RATS and ARTS. It also has the capability to sort files alphabetically - great for mailing lists that have gotten out of order.

With all these goodies how much does the KAYPRO II cost? Actually there are 3 computers in the KAYPRO line. The KAYPRO II with 195K drives is \$2595, about the same as the regular price of an OSBORNE. The KAYPRO IV with double sided 390K drives is \$3095, and the KAYPRO 10 with a double sided floppy and a 10 Megabyte (that's 10 million characters of storage, folks!) hard disk drive costs \$4695. I have the feeling that you would not want to carry a KAYPRO 10 under your airline seat, those hard disk drives are pretty fragile.

Ok, now after all of that, which is better, an OSBORNE or a KAYPRO? I think in the hardware area there is no contest, the KAYPRO has a larger screen and better physical layout. On the software front the choice is much more difficult. The OSBORNE has more big name software such as WORDSTAR and SUPERCALC while the KAYPRO has more packages with some of them (PROFITPLAN and S-BASIC) of questionable value. However if you want to buy other software, the KAYPRO disk format is common enough to make almost any CP/M package available. What about farm software? At least one farm accounting program available in the Alberta market, AG-FINANCE, from Countryside Data will operate on the KAYPRO.

Market research firms have predicted an 87% annual growth rate in the portable or transportable microcomputer market. The KAYPRO is sure to grab a good chunk of this growth given their present offering.

You can see the KAYPRO at all Data Terminal Mart locations:

170, 301 - 14th Street N.W.	105-10357 109th Street
Calgary, Alberta	Edmonton, Alberta
(403) 270-3737	(403) 420-1755

September was a very bad month for OSBORNE users as the company had filed for bankruptcy. Although not unexpected, the fall of what seemed to be a fairly solid company raises some interesting problems for owners of 'off' brands (not from the big three) or those who have discontinued models.

When you hear that your brand or specific model is no more, you should ask yourself one question. Should you hold on to the computer or get rid of it? The answer should be determined by the current use of the machine and future plans for additions. If you already have all the software in place and the system has settled down to regular and constant functions then you might as well keep the machine. It will be like the old car that gets you from point a to point b. However if you are at the start of the development cycle of your system, consider the question further. If the machine is based on a standard operating system such as CP/M or MSDOS, getting software shouldn't be a problem for some years to come (if ever). If the hardware is based on the S-100 buss, you can still obtain replacement boards from many alternate sources.

If the system has been obsoleted by a new model, is that new model upward compatible with the old? Upward compatibility means that the new machine can use the older machine's software or hardware. The same question can be asked for downward compatibility. If there is both downward and upward compatibility then keep the computer. If there is upward compatibility only you may have another 2 years before no new hardware or software is available for the older model. If there is limited (only on the BASIC language level for instance) or no upward compatibility then seriously consider dumping the machine unless you will be upgrading it to full capabilities within the next year. If you decide to dump it, then dump it fast. This is because the resale value of a discontinued model is greatly reduced. Get rid of it before potential buyers know it's obsolete! If you do decide to hang on to your old equipment then here are some tips to extend it's practical life:

1. Get hold of all the technical manuals and documentation you can. Even if you can't make head or tails of the information, a good serviceman can, and he may not necessarily be the original dealer either.
2. When you do get the technical specs, check to see how many of the chips are special custom and how many are 'industry standard'. You might consider prebuying these custom chips to guard against short supplies in the future.
3. Join a users group that specializes in your brand of machine. There are a few members in each users group that know their machine inside and out, a great source of free info! You will also be able to get access to a wide range of software to keep the system going (users groups don't pirate software? HA HA!)
4. Get copies of all the specialized magazines specifically for your hardware and subscribe to at least one. Even if the articles are mediocre, the ads will be useful in tracking down new hardware.
5. Wait for the dealers to clear out their old hardware & software stock and expand your system using those bargains. Don't wait too long though, the best stuff goes fast.
6. Keep the faith! You may not have the most advanced system on the block, but at least you have stepped off the carousel of technological change for a while!

GLOSSY MAGAZINE ON AG-COMPUTING

It's really a sign that an industry has arrived when glossy magazines come out on the subject. That just happened for ag-computing. It's called AgriComp and of course it's from the land of Reagan (we won't hold it against them though!). The issue that I saw was Vol. 2 Number 1 (July/August, 83), and if future issues are of the same high quality as this, then the mag. is worth the U.S. \$20 Canadian subscribers have to pay for 6 issues. The issue had 48 pages of which 9 pages are ads (the best part of any specialty magazine). There are reviews and small VISICALC based articles like balancing checkbooks, tracking futures and blending grain. This magazine fills a much needed gap between newsletters which may have more fast breaking news (but less analysis) and full length papers or books which may be quite detailed but obsolete by the time they reach the market).

AGRICOMP
103 Outdoors Building
Columbia, MO U.S.A. 65201
U.S. \$15 for six issues (Canada and foreign add U.S. \$5)

GRASSROOTS, THE PROMISE AND THE REALITY

Once upon a time there was this country composed of mostly hewers of wood and drawers of water. However the federal government of this country wanted to make this country a world-class leader in the fabled guild of high technology. These powerful lords assembled a lab full of white-coated magicians to find the magic formula to join the guild. After many years of work the gaunt 'techies' emerged with TELIDON. Now all they had to do was to sell the new magic formula to their neighbors to the south and the great white north would be in a state of full employment - low inflation bliss for evermore (and they might even be able to afford Medicare too!).

It just so happens that the previous story is true, although the names have been changed to protect the pensions of the innocent. Canada has been trying to sell the Telidon technology in the U.S. for several years with some limited success. However, to make an effective pitch to reluctant customers, there have to be some successful implementations here in Canada. That's where Grassroots comes in. Grassroots is the agricultural videotex system offered by INFOMART a company owned by Southam and Torstar Corp.

If the terms TELIDON and VIDEOTEX leave you cold, let me define them. VIDEOTEX is the method of transmitting data through phone lines from a central computer to a home receiving terminal. The operator uses the keyboard of his terminal to request the information he wants to see and after his message is received and processed, the information comes back to be displayed on the tube. This is different from another concept; TELETXT. Here, a set number of screens of information are constantly transmitted over the airwaves on TV and FM signals which are picked up by a decoder box that sits on top of a TV. The user tells the box which page he wants to see. The page is displayed when the next transmission goes by (every few seconds). TELIDON is the Canadian version of VIDEOTEX and has advanced color and graphics capabilities compared to other competing systems such as Britain's PRESTEL and France's ANTIOPE.

Thus, to get on Grassroots you have to buy (or rent) a special Telidon terminal or adapt a microcomputer with some expensive add-ons. An Electrohome terminal costs \$1500 to purchase although some federal government subsidized terminals may still be had for \$750. The cost of equipping a microcomputer for Telidon operation are about the same; more on that later.

You then apply to Infomart for an ID which has different charging algorithms for different user locations. In Alberta, if you live within the local call area of Calgary, the charge is 10¢ per minute. If you call Calgary from outside of the local calling area you pay nothing, except for long distance charges. If you dial in through a public access DATAPAC port (Grand Prairie, Edmonton, Red Deer, Lethbridge or Medicine Hat) you pay a flat fee of \$500/year for 6 hours of use per month. If you go over 6 hours you pay an additional \$8.00 per hour. Of course there are the long distance fees to the nearest DATAPAC port. In Manitoba the fee is a flat 5¢ per minute anywhere in the province. If a deal can be struck with AGT (not very likely at this point) a similar rate structure could apply in Alberta.

When you have the terminal and ID you are ready to go. Dial in and give your ID and password and you get a screen called "look" which contains info about new pages and any messages that are waiting to be read. These first screens are quite different from a normal computing system, they have lots of color (an average of 7 colors per screen) and the graphics look as though they are being drawn by hand. In fact, when a graphics page is created, an artist does the work on a graphics tablet so that video reproduction of the lines, arcs and painted-in areas follow the same sequence the artist used. The graphics resolution is not as high as many microcomputers (only 256x200) but it far exceeds any other Videotex system in the world and can show some surprisingly good pictures. The system is organized into separate 'pages' which have a unique number that can be typed to get to that page directly, or by following a series of menus you can arrive at the desired page.

The main index has 11 categories including the agricultural subject index, the lifestyle subject index, the messaging system, the Cantel federal government propaganda system, lists of information providers (advertisers), and various help sub-systems.

The major sub-systems are agriculture & lifestyle. Under the agricultural menu there are 20 categories. These are: 1) weather, 2) crop markets, 3) livestock markets, 4) farm management, 5) special crops, 6) newsletters, 7) news, 8) finance, 9) insurance/investments, 10) chemicals, 11) seed & feed, 12) equipment, 13) Manitoba Dept. of Ag., 14) Ag. Canada, 15) government, 16) employment, 17) research & education, 18) farm realty, 19) classified ads and 20) events. As with most of the pages, there is a way to get back to the main Grassroots index so you can start a search for information through sub-menus or sub-indexes.

Of the 20 agricultural categories, the weather and markets are the most popular. The weather screens are the most typical of Telidon's potential. Instead of just a chart of temperatures, there is a map showing this data. There are maps for Manitoba, the U.S. and even the steppes of Russia. But there are no detailed maps of Alberta; the weather data is presented as just a chart. This brings up one thread that runs through the whole Grassroots system - the data is oriented to Manitoba farmers. More information must be specific to the province of the user before full utility is realized. However the weather data was as up to date as any radio news weather report (not surprising since the information comes from Environment Canada). There seemed to be a mistake in the presentation of one screen (page 200032), the precipitation forecast for North America showed just Canada. Another fault of the maps in general was the lack of any distance scale, you don't have any idea of the size of the map of Russia unless you had looked in an Atlas beforehand. For market forecasters, the seasonal precipitation should be mapped as a percentage of normal but the present maps show only total precipitation. Despite these faults, the weather data could form the basis of good marketing decisions for anybody who could interpret them.

The market information can be obtained in two ways. You can get the price quotes on a delayed (15 minutes) basis or on a 'live quote' system. The up-to-date data from live quote costs extra but for a serious commodities trader, it would be essential. The futures prices come in from Winnipeg and Chicago. Commodities such as wheat, oats, barley, rye, flax, rape, corn, soy and potatoes are covered. Other commodities such as gold and silver can be obtained in the finance section. Livestock futures are covered for cattle, hogs, lambs, poultry and dairy. Daily street prices are available from companies such as Cargill, Pioneer, P & H and others. Not only are the daily prices available in a table form, but the chore of having to chart the info is already done for you. Every one of the markets has a high-low and close chart available with the 10 day and 40 day moving averages plotted. However my marketing expert pointed out some minor problems with the charts. The charts lack an indication of the all-time high and low as two numbers. Another problem is the lack of 100 day charts for the commodities. You can get last year's chart and this year's chart but they are not displayed side by side in a 100 week run (this is available on the stock charts). Like the weather, there are some rough edges but the immediacy and complete range of information makes the potential gain on one smart trade worth the cost of getting the service.

What about the producer who doesn't play the markets or watch the weather as much? Here the pickings get slimmer. There are a set of farm management programs which cover decisions made in the feedlot, crops, swine and general financial areas. They tend to be quite simplistic, or require data that requires pre-calculation (like feed conversion ratio in the feedlot profitability analyzer). I would put any of our microcomputer software against these programs. It's not that the programs on Grassroots are bad, it's just that they could be a lot better. Another problem is that of the level of detail available on many of the information screens. A typical Telidon screen has at maximum 20 lines of 40 characters, so this Compu-Farm contains enough words to fill almost 25 screens. Most people don't want to read that number of screens. This brings up the essential dilemma of Videotex; people want detail but are not willing to read through enough screens to get it. I think that Videotex is only good for fast breaking 'headline' kinds of information - it will never replace paper. The operator who can make money by following market trends can use Grassroots. However the lack of specific information to any useful level of detail makes Grassroots a wait-and-see decision for the average Alberta farmer. You may not have to wait long, there are rumors that both CANFARM and AGNET may be available through GRASSROOTS.

For those who can't wait to get Telidon but already have a microcomputer, there is good news (sort of). There is a very good package for the IBM PC that turns the IBM color graphics card, color monitor and modem into a terminal. The only rub is that the IBM card can only show 4 colors at a time. This means a loss of information for complex

screens (e.g. weather). The vendors of the software have adapted their product to work with the Fredrick Electronics' Plantronics color graphics board which shows 16 colors at one time. The special price for the software and board is \$850. Contact Microstar Software Ltd. 687 Mansfield Av. Ottawa, Ont. Canada, (613) 722-7426.

DATA BASE MANAGEMENT WITH DBASE II (Issue No. 8 - October, 1983)

One of the problems that the first-time user faces is the need to get his computer to store information and to get it out quickly with the minimum of trouble.

But there are three ways the user can get the computer to store data. The first is to write his own program which handles the specific kind of data to be stored. This has two problems, the time required to write the masterpiece and the specificity of the program. Let's say you spend one year writing a program to store information on your cropping system but when you're finished you would also like to keep records on the new beef operation you just started. Guess what! you have to completely rewrite the program; see you in another year! The second option is to buy a commercial program to handle the specific data. Now you don't have to spend a year writing it, but the problem of changing it to suit the new data is still there. You just have to pay \$500 per day to get the program modified! This doesn't mean that a pre-programmed application is no good, it just may be too inflexible to accommodate differing data needs. Another problem arises when two very different programs try to use each other's data. This could happen when you buy fertilizer. The entry may have to be put in twice, once for the accounting package and once for the crop management program. This is not just confined to micros, the mainframes faced it as well. The answer for mainframes was the same as it is for micros, the Data Base Manager (DBM). DBM combines the best features of the flexibility of programming by the user and the ease of buying a pre-programmed package. One of the fundamental pieces of software any micro should have is the DBM.

However, all is not as it seems in this business. There are many programs which can store data that call themselves DBM's. The difference lies in how many files of data that can be accessed at one time. Going back to our example, the files for the accounting and crops management programs must be accessed at the same time to get one fertilizer purchase recorded. Packages that can only work with one data base (a collection of related data) at a time are called file handlers. These are useful for mailing lists or other simple applications, but not for complex tasks such as livestock management systems.

The ability to handle more than one database at a time is not the only thing you should look at when selecting a DBM. The ability to do numerical calculations on the data itself is important when calculating something simple like an average daily gain calculation. The data base itself is divided into records and fields. A record is a collection of data on an individual, while a field is each piece of data that is collected or calculated and stored for that individual. If you are using a series of cards in a sow card file, each sow gets a card. This card is a record. Each card has several places to write down the information like date of birth, date of farrowing etc. Each one of these lines on the card (or record) is a field. The DBM may restrict you in the number of records, the number of fields or the total number of characters in a record. If you have a large amount of fields or records, this may be a problem. The final characteristic of a DBM is how you interact with the program. Do you go through a series of menus to define, enter, edit, retrieve and report on the data or do you use a data manipulation language? The completely menu driven DBM may be easier to use initially but may also be less flexible than the language based DBM. Some newer DBM's like INFOSTAR, combine some of the features of both.

The DBM that sells the most copies is DBASE II (PFS File, which is not a true DBM, is the most popular file handler). DBASE II is one of the oldest CP/M based DBM's on the market and sells for about \$700. It is known as a relational database which means the data is arranged in a large table and relationships between the data are completely free form. It has some restrictions in the records, maximum 32 fields per record, 254 characters per field, 1000 characters per record, and 65535 records per database. It runs on any CP/M, CP/M-86 or MSDOS based system. It is a language based system, but the language is very english-like.

Let's look at an example of using DBASE II to computerize a set of manual swine reproduction and health record cards. These cards have the following information: sow id., birth date, arrival date, description, vaccination info, breeding selection criteria, and tattoo number. There is also repeating information for date, event, no. of pigs born alive and dead, av. birth wt., no. weaned and the weight, sow weight at farrow and wean, and reasons. The card looks like this:

SWINE REPRODUCTIVE AND HEALTH RECORD

SOW ID _____	VACCINATION _____
BIRTH DATE _____	BREEDING SELECTION CRITERIA _____
ARRIVAL DATE _____	TATTOO NUMBER _____
DESCRIPTION _____	

BREEDING AND PRODUCTION RECORD

DATE	EVENT	NO. PIGS BORN		AV BIRTH WT	PIGS WEANED		SOW WT		REASONS FOR CULLING, DISEASE, PIGLET MORTALITY, ETC.
		ALIVE	DEAD		NO.	AV WT	FARROW	WEAN	

Now to transfer this into DBASE II. First you must decide if the card is to be treated as one database or two. The first 8 fields are only put down on the card once, but the data from date to reasons are repeated for each breeding event. If you had to repeat the first 8 fields for each breeding event, you would have a great amount of duplication, but the whole idea of a DBM is to keep duplication of data down to a minimum. Therefore you set up a database with the basic information on each sow (birth date etc.) and a database for the breeding and production records. The link between the two data bases will be the sow's ID number. When you set up the database, each field

must be described as to its type (alphanumeric or just numbers) and its length in characters. To start up the database you type CREATE (the database name). If you type CREATE SOWS, you will go into a routine that asks the name, type and length of the record as follows:

.CREATE SOWS

ENTER RECORD STRUCTURE AS FOLLOWS:

```

FIELD NAME,TYPE,WIDTH,DECIMAL PLACES
001 SOWID,C,9,0 ...the name (less than 10 chars), type (Character), nine characters
The rest of the fields are entered in this manner. When we display the structure we get:
STRUCTURE FOR FILE: A:SOWS. .DBF ... the name of the database in drive A
NUMBER OF RECORDS: 00000 ... the current number of records in the
DATE OF LAST UPDATE: 17/10/83 database
PRIMARY USE DATABASE ... the first database selected
FLD NAME TYPE WIDTH DEC
001 SOWID C 009
002 BIRTHDATE C 008
003 ARRIVDATE C 008
004 DESCRIPT C 030
005 VACCINTN C 030
006 CRITERIA C 030
007 TATTOO C 010
**TOTAL ** 00126 ... total number of characters in the database

```

For the breeding database we have this structure:

```

STRUCTURE FOR FILE: A:BREEDING.DBF
NUMBER OF RECORDS: 00000
DATE OF LAST UPDATE: 17/10/83
PRIMARY USE DATABASE
FLD NAME TYPE WIDTH DEC
001 SOWID C 009
002 DATE C 008
003 EVENT C 002
004 NUMBORN N 002
005 NUMDEAD N 002
006 AVBIRTHWT N 003 001 ... This field has 1 character to the right of
007 NOWEANED N 002 the decimal point
008 WEANEDWT N 003 001
009 SOWWTFAR N 004
010 SOWWTWEN N 004
011 REASONS C 060
** TOTAL ** 00100

```

Now that we have designed the two data bases, we can enter in data with this series of commands:

```

.USE SOW ....this command attaches the SOW database to the system from the diskdrive
.APPEND ....this is the command to add more records to the database

```

When you execute these commands you get a full screen data entry menu which allows the data to be entered in any order. If you wish to change any existing records, you must know what the record number (an internal number assigned by DBASE II to each record in sequence of their entry) is and type:

```

.EDIT 123 ....this brings up the same data entry screen as seen in APPEND

```

When you exit the edit subsystem, the record is automatically updated.

After you have entered and edited the data, the next step is to retrieve information from the system. Let's say you want to see the card for sow #123D36. Type in:

```

.USE SOW ...This brings in the data base, only executed once per session
.DISPLAY FOR SOWID='123D36' ...DISPLAY shows the record FOR the condition of SOWID=something

```

The retrieval can be made much more complicated by the use of the logical operators AND, OR and NOT as well as looking for inequalities. For instance:

```

.DISPLAY FOR BIRTHDATE>'83/01/01' .AND. BIRTHDATE<'83/12/31' ... gives the sows born in 1983

```

Let's try an even more complicated retrieval using both databases at once. To find the sow id's, breeding criteria and birth dates of sows that had greater than or equal to 5 piglets born dead, use these commands:

```

.USE SOW ... bring SOW into the first database area
.SELECT SECONDARY ... open up the second database area
.USE BREEDING ... bring the BREEDING database into this area
.SELECT PRIMARY ... go back to the first database area where SOW is
.DISPLAY SOWID,BIRTHDATE,CRITERIA FOR SOWID=S.SOWID .AND. S.NUMDEAD>=5
...the fields to be displayed are before FOR, S. selects a field
from the secondary database

```

You see that with two databases you can do some very complicated data retrievals, but the best is yet to come. Instead of typing in the five commands every time you want to check the databases, you can store them in a COMMAND file. Then when you want the info just type:

```

.DO FINDDEAD ... Where FINDDEAD is the name of the command file

```

Reports can also be designed to any taste with another set of powerful formatting commands. If you want to calculate things like indexes and ADG's, there are temporary variables which can store the contents of one field from one record and then be added, subtracted, divided or multiplied. The results of the calculated variables can be re-stored into a field on any database. These last two properties give DBASE II the ability to handle almost any application that requires data storage and manipulation. Ashton Tate, the software house that developed DBASE II maintains a list of all the third party software houses that have used DBASE II to create application packages. These applications range from a fencing price calculator to accounting to dairy farm management. Because of these pre-programmed applications plus the books, magazines and courses that cover DBASE II, I have no hesitation in recommending this system to anyone who needs data storage on a micro. There may be packages that are technically better but there are none with better support.

Contact: Ashton Tate; 10150 West Jefferson Blvd.; Culver City, CA 90230; (213) 204-5570, or your dealer.

If you want to know more about DBASE II read EVERYMAN'S DATABASE PRIMER by Robert A. Byers.

COMPUTERS FOR CHRISTMAS REVISITED (Issue No. 9 - November, 1983)

Here it is, Christmas '83 and the buying decisions haven't gotten any easier. The big news of the season is the loss of the TI-99/4a which is no longer being built, but is selling at fire sale prices, a good buy! Both the Coleco ADAM and the IBM PCjr will not arrive in time for Christmas and have been dropped from the comparison charts. I have included a wide range of price and capabilities but my price limit is fixed at \$1300 for a stripped down unit. Remember, if the machine is way under \$1000.00 the expandability and practical software availability may suffer. Also, the ratings are of a subjective nature and are the result of my extensive reading of magazine ads, and as such are limited by my choice of reading material. Essentials such as a cassette to store data or a display will usually cost extra. The availability of software and programming considerations are rated from 0-10.

Computer	Common Price	RAM STD	RAM MAX	Cart. Avail.	Cass. Games Avail.	Educational Avail.	Practical Software Available	Ease of Learn	Adv. Prog.	Text Chars.
ATARI 600XL	\$ 225	16	64	6	10	6	5	4	8	40x24
ATARI 800XL	\$ 420	64	64	6	10	6	5	4	8	40x24
COMMODORE Vic20	\$ 199	5	32	5	8	5	3	8	5	22x23
COMMODORE 64	\$ 399	64	64	5	8	8	5	8	8	40x25
APPLE CLONES	\$ 600?	48	64	0	DISK	9	10	4	8	40x24
TRS-80 C.C.	\$ 359	16	32	4	8	5	3	9	7	32x16
TRS-80 MC-10	\$ 140	4	20	1	1	1	0	2	3	32x16
TI 99/4a	\$85-99	16	52	4	7	8	5	8	8	32x24
TIMEX TS-1000	\$ 70	2	64	0	7	3	1	3	3	32x24

Computer	Graph-ics	Color	Sound	Key-board	Video	Cass.	Joy-sticks	Remarks
ATARI 600XL	320x192	256	2	3	1	2	2(8)	Has the most popular games.
ATARI 800XL	320x192	256	2	3	1	2	2(8)	A 600XL with more memory.
COMMODORE Vic20	176x184	16	2	3	2	2	1(8)	Price often includes cassette unit.
COMMODORE 64	320x200	16	2	3	2	2	2(8)	The most popular under \$1000 computer
APPLE CLONES	280x192	16	1	2	2	1	2(*)	Apple II clone, runs all Apple S/W. Needs a disk for most software.
TRS-80 C.C.	192x256	8	1	2	1	1	2(*)	BASIC is best of low cost models.
TRS-80 MC-10	192x256	8	1	2*	1	1	0	Low price, low capability.
TI 99/4A	256x192	16	2	2	2	1	2(8)	Best buy, but supplies will be limited.
TIMEX TS1000	64x48	0	0	1*	1	1	0	A disposable computer.

Computer: The machines selected are those available in the Alberta market as of December. Apple Clones are available from various dealers in Calgary and Edmonton, watch the computer classifieds in the papers.

Price: This is the currently advertised price in Alberta. Some of these prices are holiday specials.

RAM: The amount of Random Access Memory available, measured in thousands of characters. The larger the RAM space, the more complex the software that can be used.

Cartridge: A plug in cartridge offers the greatest convenience. These are mostly for arcade style games.

Cassette Games: They are the most plentiful source of games, but many games are only available on disk.

Educational: These are programs or cartridges that teach something or can be used in an educational environment. Many of these programs will require a disk drive.

Practical: A practical program would fall under categories such as accounting, word processing, spread sheet analysis and decision models. Usually a disk and extra memory is required to obtain these.

Ease of Beginners Programming: This is a measure of how easy a first time programmer can use features such as graphics, sound and color. The more these features are implemented with BASIC statements, the better.

Advanced Programming: These advanced features include color shading, shape definition, animation, advanced sound and others. This is a measure of "how far" you can take the system.

Text Characters: The number of characters displayed on a screen, expressed by characters/line x number of lines.

Graphics: This is the maximum number of points that can be displayed on the screen. The first number is the number of horizontal points while the second is the vertical points. More points give a lifelike picture.

Color: This is the number of colors that can be displayed on the machine at one time.

Sound: Sound plays an important role in games and other applications. The sound can be of two qualities, single voice (one note at a time) or polyphonic (chords and different sounds).

0 = no internal sound, attachments may be available

1 = single voice

2 = polyphonic

Keyboard: The style of keyboard affects its utility. Closely spaced keys, non standard size keys on keyboards make typing harder. The greater the number of keys, the easier the keyboard is to use.

1 = membrane keyboard

2 = typewriter

3 = typewriter plus special function keys

* = non standard key size or spacing

Video: Some computers will work with T.V.'s alone while others can use special monitors and T.V.'s. Serious programming will require a high quality T.V. or a monitor to avoid eyestrain.

1 = VHF (ch 3 or 4)

2 = external monitor or T.V. connection

Cassette: Some computers require a special cassette unit that will add to the cost of the system.

1 = any cassette

2 = special cassette

Joysticks: If joysticks are available, there are questions of the kind and number that can be attached. The number of joysticks and the number of directions they point to is given as:

For example: 0=no joysticks or 1(8)=one joystick with eight directions or 2(*)=two joysticks with resistive contacts giving infinite number of directions.

HOMESTUDY COURSE ON FARM COMPUTERS AVAILABLE FROM ALBERTA AGRICULTURE

(Issue No. 10 - December, 1983)

We are pleased to announce that our homestudy course on farm computers is almost complete. This will be the flagship of our extension efforts in microcomputers for the upcoming year. I will let the press release explain the rest:

Registrations are now available for a home study course on farm computers developed by Alberta Agriculture's Farm Business Management Branch. The cost of the course is \$25 (Canadian) for a set of eight lessons. Group discounts apply.

Brochures, registration forms and further information are available from Alberta Agriculture's district offices, the Farm Business Management Branch in Olds, or contact:

Home Study

J.G. O'Donoghue Building

7000 - 113 Street

Edmonton, Alberta

T6H 5T6 Phone 422-2896

"The course is geared to producers who are wondering whether they should computerize," says Paul Gervais of the Farm Business Management Branch. "If a farmer decides to go for an on-farm computer, this course will give him the background to walk into a computer store and make an informed buying decision."

The course discusses farm applications of computers, the history of computers and the parts of a computer system. It presents detailed farm applications, ranging from computerized accounting and physical recordkeeping systems to the educational potential and home uses of on-farm computers.

The course will be available for distribution in February, 1984 from the Rural Education and Development Association (REDA), 14815 - 119th Avenue, Edmonton, Alberta, T5L 2N9.

WHAT TO LOOK FOR IN A PORTABLE COMPUTER

Portable computers are going to be the biggest growth area in the whole microcomputer industry. The definition of a portable computer vs a transportable computer is the former operates without an AC power cord. The OSBORNE or KAYPRO computers are transportables while the TRS-80 Mod 100 is a true portable. Just one year ago, portable computers were basically programmable calculators with one line displays like the Sharp PC1500 and the HP41-cv. Although programmable in BASIC there was little software outside of engineering. There were no portable word processors, spreadsheets and telecommunications programs. The limited memory capacity of these earlier machines relegated them to be the "second computer" for doing things on the road. I think that the advances in portable computers are coming to the point where a portable can be the only computer you may need. I have been recently going through a selection process to buy my own portable and would like to share some of the features I looked for (a broken down truck prevents me from taking the plunge!).

Size: You want to fit a portable computer in a briefcase or under your arm, so keep it small and light. How's about 8.5"x11" and no more than 2" thick, weighing no more than 5 pounds?

Keyboard: Real typewriter sized and spaced keys. It's too much to ask for a separate numeric keypad but some of the keys on the main keyboard could do double duty as calculator keys. However, four separate cursor keys are a must. The keyboard should not make too much noise, no 'clicks' allowed, you don't want to draw too much attention to yourself in a quiet room.

Display: It should be built in and be 80 characters wide. 24 lines would be nice to have, but nobody has this for less than \$10,000.00, so look for as many lines as you can. The wide display is best for wordprocessing and spreadsheets. Can the display be viewed from a wide range of angles? Many LCD displays have problems with viewing by more than one person (someone looking over your shoulder).

Memory: Get as much memory as you can, at least 64k expandable to 256k. Many machines use the main memory to store all the programs and data, which makes the useful active storage area smaller with every stored program. If the computer has a built in storage unit, the memory is not as critical.

Permanent Storage: I think the best form of permanent storage on a portable is bubble memory. This method uses chips that will store about 128k in a small space using no power and retrieving data with lightening speed. However, at this time bubble memory is expensive, leaving the micro (under 5") disk drive as the best alternative. This will give a higher capacity of up to 256k, but at the cost of extremely high power consumption. The least desirable storage alternative is the cassette. This format has always proved itself slower and much less reliable than disks or bubble memory.

Power: Definitely rechargeable batteries with the option of an AC adaptor/charger. It would be desirable to have the batteries as standard AA, C or D size so replacements are easy to obtain from sources other than the original manufacturer.

Interfaces: There should be a parallel printer interface, a serial interface for such things as external modems, a processor bus interface for future expansion and a bar code reader port. The bar code reader could be used to enter pre-programmed software on bar codes or to read the UPC codes for inventory applications. If you are going to use the computer to telecommunicate, then a built-in direct connect modem port is desirable. It would be nice if it operated up to 1200 bits per second but 300 is more common. Other modems use the telephone handset, they are called accoustic coupler modems. These allow you to use a phone booth but are less reliable than direct connect.

Software: Built-in software should include BASIC (compatible with Microsoft Basic on other computers), a word processor, a telecommunications program, a spreadsheet and a data filer. Your own applications will determine which is most important since few machines contain all the above software. My personal preference is for word processing with telecommunications as a close second. The three most common portables in Canada are the TRS-80 Mod 100, NEC 8201 and the Sharp PC5000. The first two machines are cut from the same cloth but have some major differences. The Sharp is a considerably higher priced unit but has more advanced features. Here is a quick and dirty comparison chart:

FEATURE	COMPUTER		
	TRS-80 Mod 100	NEC 8201	SHARP PC 5000
Size in inches (DxWxH)	11.9x8.5x2	11.9x8.5x2.5	12.8x12.3x4
Weight (pounds)	3.9	3.8	11
Keyboard (totals & cursors)	72 keys, small inline cursor keys	67 keys, diamond pattern	72 keys total, inline
Numeric key pad	10 keys double as num pad	no numeric pad	no numeric pad
Display	40x8 LCD over keyboard	40x8 LCD over keyboard	80x8 flip up
Graphics	240x64 points (pixels)	240x64 points	640x80 points
External monitor option	no	yes (claimed, no details)	no
RAM memory size (std-max)	8k - 32k	16k - 96k	128k - 256k
Permanent storage	RAM memory & cassette	RAM, cassette, optional disk expansion, size n/a	RAM, bubble(128k) op. 5.25" disk 320k
Power	4 alkaline AA size	4 alkaline AA size	rechargeable pack
Interfaces (where parallel is a centronics printer port)	parallel, serial, bar code, cassette, internal buss conn.	parallel, serial, bar code cassette, CRT, disk, RAM memory cartridge	serial, cassette, disk, int. printer bubble memory cart
Modem (speed in bits/sec)	direct connect std (300 bps) opt. acoustic coupler (300 bps)	optional external acoustic coupler (300 bps)	optional external direct conn. 300bps
Built in software	BASIC, text editor, address book, scheduler, telecommunications	BASIC, text editor, telecomm	MSDOS compat. with IBM, BASIC, word processor, telecom
Price	\$1099 w 8k, \$1599 w 32k	\$1200 w 16k	\$2895 w 128k \$195 per extra 64k

To sum up the above information, the Mod 100 is good for inexpensive on-the-road writing. The Sharp is best for heavy duty computing. If you have any doubts, wait. You ain't seen nothing yet!

FEARLESS PREDICTIONS FOR '84 (Issues No. 11 & 12 - Jan. & Feb., 1984)

After months of digesting news magazine and trade journal articles, not to mention digesting some Christmas cheer, I am now ready to stick my neck out and give some fearless predictions on the ag-computer hardware and software scene.

THE BIG THREE: This will be the year of IBM if all the industry observers are correct. The PCjr is going to hit Apple and Tandy where they live, the \$2000-\$3000 hardware. I remember the complaints about technical mediocracy

that greeted the original PC. Look where it is now! This same success could be repeated with the PCjr if it is perceived to be successful by the software houses and retailers. The early indication is that they are positive. On the higher end of the scale IBM is running circles around its competitors by offering compatibility to IBM mainframes on the PC-370/XT (a card set which turns a PC-XT into a small IBM 370 mainframe) and the 3270 PC (a micro which is 4 regular IBM terminals plus a standalone PC, IBM's answer to the LISA). Look for a newer re-designed PC (with a 68000 chip maybe) and a portable to round out the product line for '84.

Apple will introduce their Macintosh in January for their board of directors meeting. I think that this will be their last chance to recapture their once dominant position. The Macintosh is supposed to be a scaled down LISA but without all of LISA's faults (slow and clumsy). Definitely watch for this one! I think this will be the last year for the lame duck APPLE III, finally dispatched by lack of software, and an Edsel like reputation. The APPLE IIe has to go down in price this year, compared to its competitors and clones it's grossly overpriced. Apple can either cut the price on the IIe or like IBM, introduce a cutdown version. Look for boards that turn a IIe into an IBM-PC, Macintosh, LISA, CRAY1 and anything else that they can think of to keep their old moneymaker around. The LISA is being killed by IBM at the targetted Fortune 500 company level, Apple just doesn't have the salesman to compete with IBM's. Look for a card which turns a LISA into a (what else!) IBM-PC. Apple is frantically trying to get software for the LISA and to lower the price to make it attractive. However they have a lot of R&D costs to recover!

Tandy is also jumping on the IBM-PC bandwagon with the Tandy 2000. Although this machine has many improvements over the PC such as true 16 bit operation, faster speed (twice), and higher capacity disks, very little of the massive amount of software for the PC will run on the 2000. This means that Tandy must convince every software house that their machine will be successful. Since it is third party support that makes micros successful, Tandy must resolve the software and hardware incompatibility problem first. Because of pressure from the PCjr, expect the price on the Mod IV to drop. There are rumors that Tandy will introduce a more powerful addition to their popular line of portable computers. The new Mod IV transportable is going to get blown out of the water by KAYPRO - \$2700 with no software. Come on Tandy, get real! I also think the Color Computer may suffer a similar fate at the hands of the Commodore 64.

The El-Cheapo computers: It's going to be Commodore all the way in '84. They are the only company making money out of the under \$1000 computers (despite quality control problems). There are rumors that a Commodore 128 will be introduced this year, as a new ante in the more-memory-for-the-dollar race. I just hope that Commodore breaks an old tradition and makes the new model compatible with the 64. Also look for an entry into the 'business' market to replace the aged 8032.

Atari is going to have to make some money sometime on their home computers. Just how desperate they are was evidenced by a price increase just before Christmas. If the new XL series doesn't make it profit-wise, we might see another TI 99/4 on the way. Nothing to get too worked up about, there are enough games out there to keep one playing for several lifetimes.

TIMEX has introduced the 2068 which has color, a low price, and a keyboard that has been described as having a feel like typing on dead flesh. Software may be a problem at first. Timex will still be a good bet for a truly disposable computer.

The biggest sleeper or potential dog this year may be the COLECO ADAM. When it is finally delivered at a price of just over \$1200, it may be the best value of '84 if it works. The printer is one of the slowest and noisiest on the market today, and the ADAM still uses tape cassettes (Coleco calls them digital data packs, new heights in newspeak!). I urge caution for anyone buying one, see if the rumored quality control problems are resolved first.

The clones and compatibles: As Apple's share of the market shrinks, the company's legal battle with the clones may become even more vicious, as Apple tries to protect its share. However, with so many clone makers jumping onto the IBM bandwagon, there may be nobody left to litigate. I pity any company who has to come up against IBM on copy-right infringement cases. The only reason that IBM clones exist is that IBM cannot meet present demand, thus keeping PC prices above the clones. This could change rapidly as new production facilities come on stream. I do think there will be a good niche for the near compatibles from such larger companies as Texas Instruments (to be reviewed in the next issue of Compu-Farm) and Digital Corporation. They have the corporate resources to follow a parallel course to IBM. But buying from a smaller company involves asking the question, how compatible is it with the 'Big Guy'. Even if the company then goes belly-up you can keep on running with IBM software and hardware.

THE JAPANESE: I think this will be the year that the Japanese make their big push. They now have a standard (IBM) to follow and their slowly growing dealer networks may have finally reached critical mass. Every Japanese machine I have seen in the last year has offered good graphics, color and keyboards. Some like the EPSON QX-10 have offered good price/performance ratios as well. I think the potential winners this year may be NEC (the largest micro manufacturer in Japan), SHARP (for their innovative portable unit) and EPSON (the QX-10 is a good buy). Compatibility with either CP/M or MSDOS will be the deciding factor in making the Japanese machines successful. In the low cost equipment the Japanese have worked with Microsoft to develop the MSX standard. However, given Commodore's grip on the low end market, a standard in name only does not guarantee market acceptance.

PORTABLES & TRANSPORTABLES: Now that OSBORNE is out of the way, KAYPRO will be the dominant force in the transportable section of the market. They have introduced an add-on board which will give their equipment MSDOS capability (with some compatibility to IBM). The SHARP PC-5000 may become the most popular high performance portable because it has the most features for the money, but in the lower cost class, the TRS-80 Mod 100 will continue to be a strong seller.

Operating systems: MSDOS and PCDOS (the IBM version of MSDOS) will continue to dominate the PC end of the market, leaving CP/M-86 in the dust. Although Concurrent CP/M-86 has a headstart in the multi-tasking operating systems (where your computer can do four things at one time, e.g. manage the feeding system and the accounting system at the same time), MSDOS 3.0 will still blow it off the market. If Microsoft has any sense at all, they will make the large installed base of MSDOS programs compatible with this new concurrent operating system. UNIX, PICK and other multi-user operating systems will have little impact on the Joe Average computer because of the great

amount of machine resources required (8 megabytes just for the operating system alone!!!). APPLE has now put itself into the same league as COMMODORE by offering operating systems that work exclusively on their equipment. These are the new LISA/MACINTOSH operating systems and PRO-DOS (APPLE's last kick at the clone makers, it doesn't run on a clone that has changed the ROMS from the original APPLE II+). Speaking of tying down your customers, look for IBM to introduce its own operating system on the new PC. I don't think a company the size of IBM is really too interested in maintaining links with small fry like Microsoft, they must have thousands of qualified staff to do the job. The use of MSDOS has opened IBM up to competition by all the other "me-too" companies, a proprietary operating system would make it harder to duplicate the system.

Windowing systems: Windows are a way of dividing a computer screen into several areas that carry out different functions where data can be passed between these functions. Usually these systems use a mouse which points to objects on the screen which can be selected as menu items. For instance you could have a spreadsheet in one window and a word processor in another window. With the mouse you select part of the template in the spreadsheet and point to the part of the wordprocessor window you want it to go. Although I think this is a pretty stupid method of using a computer (Da, I want dat one!), unfortunately it is going to be fabulously popular. Microsoft WINDOWS will be the best seller on the IBM style machines with LISA setting the standard for non-IBM computers.

Integrated software: If I see another ad for a spreadsheet/word processor/data base manager I think I will heave all over my keyboard! Now, I get all these ads wrapped up into one product - the integrated application. I hope this will cut down on the number of ads in my favorite mag! Unfortunately there will just be more ads for integrated software! This will be the year for integrated software that combines the three functions mentioned above plus graphics, communications, and a calendar. To stay on top of that race, LOTUS (of 1-2-3 fame) has just announced a new integrated application called Symphony.

Ag-software: I predict that everybody that had a grandfather that lived on a farm and has over grade six education will be writing ag-software this year. I also predict that they will all starve! I pity anyone that has to buy software under these conditions. Please John Deere, won't you please just bless somebody's software and get us out of this mess! On a more serious note, the hot prospects in ag-software this year will be attached up to some sort of process control or automatic data logging equipment. The weak part of any computer user is the person behind the keyboard (even with a mouse!). Anything that cuts down data entry will make things go easier.

THE TEXAS INSTRUMENTS PROFESSIONAL COMPUTER

I know what you're thinking. TI got out of the computer business, right? Wrong, TI is out of the home computer market but is still strong in personal computers. The TI/PC is a machine that deserves serious consideration by anyone who is looking for a machine in the IBM/PC range of capabilities. AiTel Data lent us a unit for two weeks to give us a good look. Let's examine the parts and compare it to the IBM PC.

Hardware: The TI is almost the same size as the IBM. The front of the main box is plastic with snazzy curves. The overhang of the molding did not seem to let the drives open all the way giving us some difficulty in disk insertion. The rest of the box is very plain with square corners. The rocker style power switch is not recessed like the IBM. The fan on our model was quite noisy. I hope they aren't all like that. Our model had a 5 megabyte hard disk that operated very well, although it did not have the new MSDOS 2.x series which makes easier use of the hard disk (it is available). The most impressive feature of the machine is the keyboard which contains 97 keys organized better than the IBM. There are 12 special function keys across the top, dangerous editing keys are separate from the main keys, the cursor keys are in a diamond pattern with HOME in the middle. The numeric pad has +, -, space, tab, comma, and an enter key. The caps-lock key has a little light in it. The main body of the keyboard is laid out like a Selectric with wide keys for the ham-fisted. The whole keyboard has infinitely variable tilt. I saw three minor problems with the keyboard. The keys tended to bind when not struck vertically, the keystroke is quite shallow i.e. fires in the first quarter of travel, and there is no pencil shelf. However in spite of this, this is one of the best keyboards available. The other exemplary feature is the color display system. The resolution (720x300 points), the color (8 colors at hi-resolution) and the character clarity are all vastly better than the IBM. If you buy a TI spend the extra bucks to get the color, it's worth it. The guts of the TI are the final distinguishing feature, there are 5 free slots because the disk controller and parallel printer card are on the main circuit board. The mother board can be expanded to 256k by just plugging in chips, expansion past 256 needs a separate board.

Documentation: The books that come with the TI are of equal quality to IBM's guide. The installation and getting-started instructions are excellent with lots of pictures. The MSDOS manual is better written than IBM's in some areas. There is less technical information on the inner workings of DOS, neither here-nor-there for beginners. The Basic manual is only half as thick as the IBM's with less information on getting started (no pictures of the keyboard for the editing functions). Statements are grouped by function rather than strict alphabetic, this makes the manual less useful for reference. The IBM manual has more appendices but not a quick reference book. Having no tutorial sections, neither manual is for beginners, but the IBM manual has the edge as a complete reference guide. The only other piece of software we had was 1-2-3 which has the same manual for both machines.

Software: LOTUS 1-2-3 is the one program you should see if you want to get sold on the TI. It operates the same as the IBM version with some important differences. The full graphics of the TI are used in hi-res. Graphs come out twice as detailed. 1-2-3 has six graph ranges, the IBM can only show three colors before repeating, but the TI can show six different colors at once (leaving two in reserve). Although when you tried to print the graph on an EPSON, the graphs came out with the same graphics resolution as the IBM. I'm sure the EPSON can duplicate the 720x300 pixel range of the TI, so what goes here? The TI had no problem reading our IBM formatted 1-2-3 files (they have the same disk format), but the TI's version of BASIC was not as compatible. When we loaded in our standard BASIC programs there were some problems with locating the cursor at the appropriate locations. The cursor would appear one line below the intended line until a key was struck, then it returned to its proper position. The graphics commands are not as powerful as those on IBM's BASIC 2.0 and event trapping (where the program executes a subroutine when a special function key is pressed, or the lightpen is touched to the screen etc.) is not supported. This does not seem to be the GWBASIC that can be obtained from Microsoft, but a BASIC 5.0 with some graphics extensions.

Compatibility: Luckily the TI is not sold as an IBM compatible since only one out of 30 IBM programs we tested ran on the TI (it was dBASE II). However, since they use the same disk format, data files can be exchanged. in ag-software, Countryside Data using CP/M-86 was the only program which could run unmodified. Although, any program which uses dBASE II, 1-2-3 or some other higher level language would have no problem running. If a program uses compiled BASIC or special IBM graphics commands in the interpreter, conversion will be required.

Prices: A TI with color monitor, two disk drives, three plane graphics (to give 8 colors at hi-res) and 256k would cost \$5160. An equivalent IBM would cost about \$1000 more.

Conclusions: With eleven service centers across Alberta, Altel Data offers the best service of any computer vendor. This plus the obvious virtues of the TI make a good combination for Alberta farmers to look at. Don't think of this machine as an IBM compatible because it isn't. It stands on its own merits and must be considered as such. The only rub is in the area of software availability. The TI has all the super-star software but does not have the wide range and depth of the IBM's software offerings (through third parties). However, TI seems to be making a real effort to get ag-software on their model. I got a very nice kit for software developers from TI the other day. It had all sorts of deals and discounts for those who were willing to convert their ag-software. Those looking at big blues' machine had better make sure they look at the TI before they sign the cheque, it might be worth their while.

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How far off the mark was the target?

at 100

What about the weather?

Weather was very good

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